

INSTITUTIONS HOLDING MEMBERSHIP IN THE ASSOCIATION

ILLINOIS
University of Illinois, School of Pharmacy, Urbana; Dean S. Hahn, Dean (1922).

CALIFORNIA
University of Southern California, College of Pharmacy, Los Angeles; Alvin G. Smith, Dean (1922).

CONNECTICUT
University of Connecticut, College of Pharmacy, Storrs; Arthur C. Washburn, Dean (1922).

MASSACHUSETTS
University of Connecticut, College of Pharmacy, Storrs; Arthur C. Washburn, Dean (1922).

OHIO
University of Cincinnati, School of Pharmacy, Cincinnati; W. H. Brown, Dean (1922).

INDIANA
University of Indiana, College of Pharmacy, Indianapolis; Clarence L. Cooper, Acting Dean (1922).

MARYLAND
University of Maryland, College of Arts and Sciences, Towson; E. Leach, Dean; University of Maryland, College of Pharmacy, Baltimore; Dean (1922).

MASSACHUSETTS
University of Massachusetts, College of Pharmacy, Amherst; John A. White, Dean (1922).

MISSISSIPPI
University of Mississippi, Southern Branch, Hattiesburg; Dean (1922).

MISSOURI
University of Missouri, College of Pharmacy, St. Louis; Carl H. Carter, Dean (1922).

NEW YORK
University of New York, School of Pharmacy, New York; Dean (1922).

NEBRASKA
University of Nebraska, School of Pharmacy, Lincoln; Dean (1922).

NEW JERSEY
University of New Jersey, School of Pharmacy, Newark; Dean (1922).

NEW YORK
University of New York, School of Pharmacy, New York; Dean (1922).

NEW YORK
University of New York, School of Pharmacy, New York; Dean (1922).

KENTUCKY
University of Kentucky, College of Pharmacy, Louisville; Gordon L. Garry, Dean (1922).

LOUISIANA
Loyola University, New Orleans College of Pharmacy, New Orleans; John F. McCloskey, Dean (1922).

LOUISIANA
Xavier University, College of Pharmacy, New Orleans; Lawrence F. Ferring, Dean (1922).

MARYLAND
University of Maryland, School of Pharmacy, Baltimore; Andrew G. DuMan, Dean (1922).

MASSACHUSETTS
Massachusetts College of Pharmacy, Boston; Howard G. Newton, Dean (1922).

MICHIGAN
University of Michigan, College of Pharmacy, Ann Arbor; Howard A. Lewis, Director (1922).

MICHIGAN
Detroit Institute of Technology, College of Pharmacy and Chemistry, Detroit; Helen F. Stout, Dean (1922).

MICHIGAN
Ferris Institute, College of Pharmacy, Big Rapids; Howard Hopkins, Dean (1922).

MICHIGAN
Wayne University, College of Pharmacy, Detroit; Roland T. Lakey, Dean (1922).

MINNESOTA
University of Minnesota, College of Pharmacy, Minneapolis; Charles E. Barnes, Dean (1921).

MISSISSIPPI
University of Mississippi, School of Pharmacy, Oxford; Elmer L. Hammond, Dean (1922).

MISSOURI
St. Louis College of Pharmacy, St. Louis; Charles E. Casper, Dean (1922).

MONTANA
State University of Montana, School of Pharmacy, Missoula; Charles E. F. Mallett, Dean (1922).

NEBRASKA
Creighton University, College of Pharmacy, Omaha; William A. Jarrett, Dean (1922).

NEBRASKA
University of Nebraska, College of Pharmacy, Lincoln; Rufus A. Logan, Dean (1922).

NEW JERSEY
Rutgers University, The State University of New Jersey, New Jersey College of Pharmacy, Newark; Ernest Little, Dean (1922).

THE AMERICAN JOURNAL

— OF —

PHARMACEUTICAL EDUCATION

Vol. VI

April, 1942

Number 2

CONTENTS

| | |
|---|---------|
| The Objectives of the Program of Pharmaceutical Education— <i>Robert C. Wilson</i> | 174-180 |
| Pharmaceutical Education and the Public Health— <i>Dr. Nathan B. Eddy</i> | 180-185 |
| Pharmacy's Service to the Public— <i>Hugh C. Muldoon</i> | 186-190 |
| Pharmaceutical Education from the Standpoint of the Physician — <i>Dr. Elmer B. Freeman</i> | 190-199 |
| Chemistry's Debt to Pharmacy and Pharmacists— <i>Arthur E. James</i> | 199-214 |
| Cinchona and the Count of Chinchon— <i>Georgianna Simmons Gittinger</i> | 214-218 |
| Should the History of Pharmacy be Taught in the First Year of the Curriculum?— <i>Cyrus L. Cox</i> | 218-219 |
| The Education of an Educator— <i>Paul J. Jannke</i> | 219-226 |
| A Course in Theoretical and Practical Pharmacy for the First Year Student in Pharmacy— <i>Leon A. Thompson</i> | 226-234 |
| The Usefulness of Manufacturer Publications— <i>Charles O. Wilson</i> | 234-237 |
| An Outline of Material Suggested for the First Year Course in Pharmacy— <i>Charles V. Netz</i> | 238-241 |
| Courses in Pharmaceutical Economics— <i>C. Leonard O'Connell</i> | 241-243 |
| Some Observations Concerning a Syllabus of Commercial Sub- jects in a College or School of Pharmacy— <i>Joseph H. Goodness</i> | 243-245 |
| Personnel, Lighting and Store Location as Factors in Merchan- dising— <i>D. B. R. Johnson</i> | 246-247 |
| Correlation of the Teaching of Dispensing Pharmacy and Quan- titative Analysis— <i>Elmer M. Plein and Edgar A. Kelly</i> | 248-250 |
| The Teaching of Organic Pharmaceutical Chemistry— <i>Lloyd E. Harris</i> | 250-252 |
| A Situation and a Plea— <i>L. Wait Rising</i> | 253-255 |
| What is to be Gained by Speeding up the Educational Program <i>Leslie B. Barrett</i> | 255-258 |
| Material for a Scheele Exhibition..... | 258 |
| Editorials | 259-263 |
| The Editor's Page..... | 267-271 |
| Gleanings from the Editor's Mail..... | 272-275 |
| Notes and News | 276-283 |
| Miscellaneous Items of Interest..... | 284-296 |
| New Books | 297-300 |

Published quarterly by the American Association of Colleges of Pharmacy at Lincoln, Nebraska. (Claffin Printing Company.) Subscription price \$2.00. Single copies 50 cents. Entered as second class matter July 1, 1937, at the postoffice at Lincoln, Nebraska, under the Act of August 24, 1912.

Editorial Office: College of Pharmacy, University of Nebraska, Lincoln, Nebraska. Address all communications to the Editor.

Second Edition, Revised and Enlarged

PHARMACEUTICAL DISPENSING

By WILLIAM J. HUSA

Head of the Department of Pharmacy, University of Florida

794 + xii PAGES

99 ILLUSTRATIONS

PRICE \$4.00

AN OUTSTANDING TEXTBOOK

Latest information on compounding, dispensing, incompatibilities, professional pharmacy, hospital pharmacy, dental pharmacy, etc.

HUSA BROTHERS

IOWA CITY, IOWA

Preliminary Statement Covering the 1942 Convention of the A. A. C. P.

The forty-third annual meeting of the American Association of Colleges of Pharmacy will be held in Denver at some time either the latter part of August or the first part of September. Dr. E. F. Kelly, of the American Pharmaceutical Association, is in close touch with the Local Arrangements Committee and every effort is being made to arrange the time of this meeting so that as many delegates as possible may be present. The announced dates of the Convention may be changed if a more suitable time for holding the meeting can be determined.

Regardless of the dates, our sessions this year should have a special significance to all pharmaceutical educators. Many of the Association's problems as well as the problems of American pharmacy must be solved and frank expressions of opinion and discussion are necessary in order to arrive at the best possible solutions. From time to time during the past year the chairmen of our committees have made progress reports to the Executive Committee. These reports show careful planning and unusual activity. Our committees are carrying on for our Association in a most commendable manner and you will be interested in hearing about their accomplishments. The program will have one or possibly more special and worth while features. These will be announced later and I am sure they will prove to be most interesting and informative. It will be worth making the trip to Denver just to attend the Joint Session with the National Association of Boards of Pharmacy. The officers of the N. A. B. P. have complete charge of the arrangements for the joint dinner and I feel sure that the program will equal or exceed in interest and value those that have been held before.

Never before in the history of our Association has it been more important for us to confer on those matters which must be solved so as to bring credit to the Association and be of the greatest value to our country. I sincerely hope that you will make every possible effort to be present and give us the benefit of your advice and sound thinking.

Charles H. Rogers, Chm.
Executive Com., A. A. C. P.

Officers and Elective Committees, 1941-1942

PRESIDENT

RUDOLPH ANDREW KUEVER - - - Iowa City, Iowa

VICE-PRESIDENT

PERRY A. FOOTE - - - *Gainesville, Florida*

SECRETARY-TREASURER

ZADA M. COOPER - - - - - Iowa City, Iowa

EXECUTIVE COMMITTEE

CHARLES H. ROGERS.....1942 *Minneapolis, Minnesota*

ANDREW G. DUMEZ.....1942 *Baltimore, Maryland*

HOWARD C. NEWTON..... 1942 *Boston, Massachusetts*

IVOR GRIFFITH.....1943 *Philadelphia, Pennsylvania*

FOREST J. GOODRICH.....1943..Seattle, Washington

RUFUS A. LYMAN, Editor.....Lincoln, Nebraska

H. EVERT KENDIG,
Past President.....*Philadelphia, Pennsylvania*

RUDOLPH A. KUEVER,
President.....Iowa City, Iowa

ZADA M. COOPER,
Secretary-Treasurer *Iowa City, Iowa*

SYLLABUS COMMITTEE

HOWARD C. NEWTON.....1942....*Boston, Massachusetts*

ELDIN V. LYNN.....1943....*Boston, Massachusetts*

JOSEPH B. BURT.....1944....Lincoln, Nebraska

HENRY M. BURLAGE.....1945...*Chapel Hill,
North Carolina*

ELMER H. WIRTH.....1946....*Chicago, Illinois*

ELMER L. HAMMOND.....1947....*Oxford, Mississippi*

L. WAIT RISING.....1948....*Seattle, Washington*

PRESIDENT ELECT FOR 1942-1943

HOWARD C. NEWTON.....*Boston, Massachusetts*

The American Journal of Pharmaceutical Education

THE PUBLICATION BOARD

RUFUS A. LYMAN
Chairman and Editor

ZADA M. COOPER
Secretary

Charles H. Rogers

Andrew G. DuMez

H. Evert Kendig

Rudolph A. Kuever

Ivor Griffith

Howard C. Newton

Forest J. Goodrich

Assistant to the Editor

Paul J. Jannke

COLLABORATORS

| | |
|--------------------------|---|
| Airston, Margaret..... | University of Southern California |
| Alstodt, Berl S..... | Long Island University |
| Ambroz, Walden F. | Indianapolis College of Pharmacy |
| Baker, George L..... | University of Toledo |
| Barrett, Leslie B..... | University of Connecticut, College of Pharmacy |
| Bedworth, Wilfrid J..... | University of Buffalo |
| Bienfang, Ralph D..... | University of Oklahoma |
| Boughton, Lloyd L..... | University of Kansas |
| Bradt, Frederick T..... | Wayne University |
| Busse, Louis..... | University of Wisconsin |
| Canis, Otto F. A..... | Fordham University |
| Cataline, Elmon L..... | University of Michigan |
| Cole, B. Olive..... | University of Maryland |
| Cooper, Chauncey I..... | Howard University |
| Cwalina, Gustav E..... | Creighton University |
| Daubert, Bernard F..... | University of Pittsburgh |
| Davis, W. John..... | Duquesne University |
| DeKay, H. George..... | Purdue University |

| | |
|---------------------------|---|
| Durand, Edwin M..... | New Jersey College of Pharmacy |
| Eidsmoe, Clark T..... | South Dakota State College |
| Ferguson, Noel M..... | St. Louis College of Pharmacy |
| Geiler, Frederick L..... | West Virginia University |
| Gidley, William F..... | University of Texas |
| Gramling, Lea G..... | George Washington University |
| Hargreaves, George W..... | Alabama Polytechnic Institute |
| Hiner, L. David..... | Ohio State University |
| Ireland, Edward J..... | Loyola University |
| Jacobs, Marion L..... | University of North Carolina |
| Jones, James W..... | State University of Iowa |
| Johnson Carl H..... | University of Florida |
| Johnson, William W..... | University of Mississippi |
| Kelly, Charles J..... | Xavier University |
| Kerker, Eleanor..... | Columbia University |
| McDonnell, John N..... | Philadelphia College of Pharmacy |
| McFadden, G. Horace..... | Ohio Northern University |
| Mantz, Harry W..... | Temple University |
| Martin, Lewis E..... | University of Illinois |
| Melendez, Esteban N..... | University of Puerto Rico |
| Meredith, Donald T..... | Detroit Institute of Technology |
| Miller, Clifton E..... | North Dakota Agricultural College |
| Mills, Lucille M..... | University of Nebraska |
| Morrison, Robert W..... | University of South Carolina |
| Netz, Charles V..... | University of Minnesota |
| Ohmart, Leslie M..... | Massachusetts College of Pharmacy |
| Prout, William A..... | Medical College of the State of South Carolina |
| Reyes, Feliciano..... | University of the Philippines |
| Rising, L. Wait..... | University of Washington |
| Rivard, W. Henry..... | Rhode Island College of Pharmacy |
| Rowe, Thomas D..... | Medical College of Virginia |
| Schwarz, A. John..... | University of Tennessee |
| Slone, Earl P..... | Louisville College of Pharmacy |
| Smith, Arthur C..... | Ferris Institute |
| Sprowls, Joseph B..... | University of Colorado |
| Stuhr, Ernst T..... | Oregon State College |
| Sumerford, W. Taylor..... | University of Georgia |
| Swinyard, Ewart A..... | University of Idaho, Southern Division |
| Trupp, Malcolm S..... | Western Reserve University |
| Vincent, Hugh C..... | State College of Washington |
| Waldon, Curtis H..... | University of Montana |

The Objectives of the Program of Pharmaceutical Education*

ROBERT C. WILSON

School of Pharmacy, University of Georgia

To consider and interpret intelligently the present and plan for the future, it is imperative that we have some perspective of the past. Therefore, I am introducing at this point a brief historical background of the development of the program of pharmaceutical education.

Many of us can think back to the days of apprenticeship and preceptorship as a medium of instruction in pharmacy and in medicine, out of which system, in both instances, a program of broader education has evolved. Medicine, sooner than pharmacy, recognized the necessity for a scientific program of education for its practitioners and, therefore its program is much farther advanced than that of pharmacy. But, even though pharmacy acquired a slow start, its progress during the past twenty-five years has been perhaps more rapid than was true of the first twenty-five years in the development of the program of medical education.

Whereas, twenty-five years ago there were a number of schools of pharmacy over the country, the curriculum in most of these schools was limited and extended over a period, usually, of two years. Only in a very few states in the union was there any legal statute setting up minimum educational requirements for the licensure of pharmacists. But, at the present time, forty-seven of the forty-eight states have a prerequisite law with a minimum of four years of college work, and in addition, one or more years of internship in a pharmacy as a requirement for licensure.

Much criticism has been directed at pharmacy because of the apparent increase in the spirit of commercialism which has seemed to dominate its practice. Such criticism perhaps is justified from a professional point of view, but, this phase in the evolution of the present type drugstore came about during those years when the educational requirements were negligible and it was easy to acquire a license to practice pharmacy, with the result that, the number of drugstores or

*Read before the Medical-Pharmaceutical Conference, Cleveland, Ohio, April 6, 1942.

pharmacies rapidly increased beyond the number necessary for professional pharmaceutical service. The introduction of various items of merchandise not relevant to pharmacy seemed a necessity to provide a sufficient volume of business to enable the store to continue. But, there is at this time a tendency for the pendulum to swing in the other direction toward a decrease in the number of stores and in the number of licensed pharmacists. There are many evidences of a keen desire on the part of retail pharmacists in America to develop or to acquire a more definite professional spirit and practice at the expense of commercial practices as witnessed by the increase in the number of professional pharmacies. Following the war and the changes which will come during and after it, it is apparent that there will be a sharp decrease in the number of drugstores in America, particularly in the larger urban areas where it is anticipated hospitals will increase in number, each having its own dispensary or pharmacy under the direction of a licensed pharmacist. As a further indication that the number of drugstores will decrease, the number graduating from the accredited schools of pharmacy in America is far less than the number necessary to act as replacements for those who die or otherwise pass out of practice.

The drugstore of the rural or small town community has come to be a popular and important and influential institution. Through its doors each day passes a large percentage of the population of these communities thus affording the pharmacist an opportunity for personal contact with that large proportion of our people who are most prone to rely upon self-diagnosis and treatment and, therefore, most in need of intelligent scientific guidance in matters affecting their health and general welfare. This group constitutes an important part of our population. Based on the knowledge of the increasing tendency on the part of the public to think of the pharmacist as a scientifically trained person and that the demand for scientific information is ever on the increase, the individual pharmacist, the boards of pharmacy and the colleges of pharmacy initiated steps leading to a broad program of education and training for those who would qualify themselves to render a broader and more intelligent service to that part of the public seeking advice and guidance. The recognition of these conditions and the desire to contribute to their solution came to be the first objective in our program of education.

Recognizing its responsibilities in the health and welfare of the people of America, state and federal pharmaceutical bodies took upon themselves the responsibility for the passage of laws which would limit the sale of those drug items which constituted a menace to the health of the public to those who are professionally qualified to handle them. The first narcotic laws were introduced into the state legislatures by the pharmacists of those states prior to the existence of the Federal Harrison Anti-Narcotic Act, which, in turn received the full indorsement and cooperation of organized pharmacy. In more recent years the passage of state acts regulating the sale of the barbiturates and other dangerous drugs were promoted by organized pharmacy.

The present Federal Food and Drugs Act received, early in its inception, the full and enthusiastic support of the American Association of Colleges of Pharmacy and of other organized pharmaceutical bodies. In its legislative activities in the passage of these and other laws, organized pharmacy evidenced its interest in and concern for the health and welfare of the American people. Thus, a second objective of a program of pharmaceutical education was born, and today, pharmaceutical jurisprudence is a part of our educational program.

The practice of self-diagnosis and self-treatment on the part of laymen is without question a menace to their health and welfare and we know of no means of solving this problem other than through a program of education to be carried on through intelligent cooperation between *all* of the health agencies. Neither of which, heretofore, has assumed this responsibility, except in isolated instances, and very definitely there has been no joint action. In a free America it has been considered to be an inalienable right of the individual to deal with his body as he sees fit, with the result that, there are thousands of wrecks by the roadside. If the health agencies of America are to assume a proper role in the solution of this problem, results can only be achieved through a long and tedious process of education and through intelligent and unbiased cooperation. To properly and intelligently contribute its full portion of responsibility to the solution of this problem, thus, becomes another objective in the program of pharmaceutical education.

When the era of specialization dawned, it was recog-

nized that pharmacy was a very definite and highly specialized field of medicine and other health agencies. We take it that there is no argument over the fact that specialization is based on sound, scientific principles, and that, it was right and proper so far as the health agencies were concerned that each should function in its specialized field; but, it was definitely unscientific and illogical not to provide some medium for proper coordination and integration of the activities of the health agencies. The need for specialized fields of activity becomes more apparent from day to day as the field of scientific knowledge expands and extends. It is utterly inconceivable that medicine or any of the other health agencies can keep abreast of and familiar with the horde of therapeutic agents which have come into use in recent years on an ever increasing basis. This is definitely within the specialized field of pharmacy and it becomes an objective of our program of education to stimulate pharmacists to qualify themselves to intelligently and broadly function in this their specialized field.

Scientific research constitutes one of the most potent forces in present day civilization, and, this is particularly true of research in those fields having to do with the health and welfare of our people. Research in therapeutic fields is not confined to the large heavily endowed foundations or to the large pharmaceutical manufacturers, but quite notable contributions have come in recent years from the schools of pharmacy in America, and today, some program of research on an ever increasing basis is being carried on in practically all of the accredited schools and colleges of pharmacy. It thus becomes an important objective for our program of education to promote research of a high order.

No specialized activity or scientific endeavor can hope to go far or achieve much without the medium of proper literature in that field. Recognizing this fact, pharmacy has made some progress as witnessed by the quality of such publications as the *Scientific Edition of the Journal of the American Pharmaceutical Association*, the *Practical Edition of the American Pharmaceutical Association* and the *American Journal of Pharmaceutical Education*. Pharmacy recognizes that there is a need for further extension of its literature and it therefore becomes an objective of the program of pharmaceutical education to stimulate and encourage such development.

The undergraduate curricula in the accredited schools of pharmacy are set up on the basis of a syllabus which has been very carefully compiled by representatives from practically every phase of pharmacy, and, represents what their experience dictates are the needs of those entering any phase of the practice of pharmacy to render the type of service referred to. That the pharmaceutical syllabus might have been improved through the cooperation of medical and other health agency advisers, is very definite, but no machinery has existed heretofore which would have made such cooperation possible. In improving our syllabus in the future, it is to be hoped that medical and health educators will make their services available to us, to the end that, pharmacists may receive that training in their specialized field which can be of greatest service to the medical practitioner and other health agencies, and that, on the basis of this cooperation, students in the various schools involved may be given instruction as to the service pharmacists might, could, and should render the physician and other workers in the health field. The curriculum as now outlined provides one year of work including a study of English, social science, foreign language, mathematics and beginning biological and physical science. The basic sciences of chemistry, biology, botany, physics and bacteriology constitute the background for the strictly professional courses in pharmacy, pharmaceutical chemistry, pharmacognosy and pharmacology. The pharmacy curriculum, therefore, offers an opportunity for correlation and integration of the basic sciences thus affording a splendid background for specialization in any one of the fields of science. As an evidence of this fact, many of our graduates have been notably successful in the study and practice of medicine or in graduate work following an advanced degree in some field of chemistry or pharmacology or biology. It is, therefore, an objective of our program of education to encourage a select number of our students to continue their studies on a graduate level.

At the present time thirty-two state universities have as an integral part of the University a school or college of pharmacy and the same is true of a number of other endowed or locally supported universities. In each of these institutions the school or college of pharmacy is on a dignified and secure basis, and, is recognized on the campus as a genuine

asset by reason of the fact that the scholastic standards in the schools of pharmacy are on a professional basis and exercise an influence on the entire undergraduate program of the university. It is, therefore, an objective of our program of education to maintain the school of pharmacy in the university on such a basis as to command the respect and confidence of the faculty and student body of the university.

The fact that our four-year graduate has had contact with practically all of the basic sciences in addition to their integration in the specialized field of pharmacy, and further in view of the fact that he occupies a strategic position in the drugstore of America, he becomes the one man in the community who is constantly accessible to the public for consultation and advice in scientific matters coming to the attention of the public, and which excite their interest. It is, therefore, an objective of our program of education to qualify our graduates to render this type of service and thus begin a program of education of the public in health matters on a personal basis. We believe that through such training, and, by virtue of the many personal contacts the pharmacist has, he may eventually become a potent influence in popularizing the principles of public health and acquainting the public with its values, but, we would much prefer that, if the pharmacist is to function in this capacity as we believe he should, there should exist between pharmacy and medicine, and other health agencies an understanding and definite cooperation in such an individual program of education of the public.

Studies are already underway to determine what the next step in pharmaceutical education should be. Whether it will take the form of at least one year of pre-pharmacy college training with four years of technical or specialized training, or, whether a graduate program superimposed on the present one leading to the master's or the doctor's degree, will be determined very definitely by the attitude of medicine and the other health agencies toward the program upon which pharmacy is launched, and whether the services it is prepared to render will be utilized. We take it, therefore, that the immediate present constitutes a critical period in the life of pharmacy, and since the medical program of education has extended over a period of fifty years as against our program which has extended over a period of twenty-five

years, we feel that medicine should be in position to intelligently advise us on the further development of our program, to the end that, an understanding and spirit of cooperation may exist between the two professions.

As we see it in our contacts with the public, there has seemed to be through the years no coordination between the health professions in building a real health program for America, with the result that, conditions in this respect at this time are definitely chaotic. Each group has very definitely operated independently of the other with the natural result that charges and countercharges are rampant, all of which, it seems to us, could be clarified so far as the future is concerned, providing, we, of the health professions give serious consideration to the establishment of ways and means by which the health and welfare of our people may be assured through intelligent cooperative thinking and planning on the part of all health agencies.

We refer to the present as an enlightened era, at least from a scientific point of view, but we doubt if it can be correctly so interpreted in so far as we of the health professions are concerned, if we continue our failure to coordinate our efforts and training. It becomes, therefore, our hope that out of this conference, the first time in the history of pharmacy or medicine the two professions have met in joint session for discussion of their objectives and programs, some statement of guiding principles will be evolved whereby organized pharmacy and medicine and the other health agencies may in the future more definitely correlate their programs of education and practice, so that, each may, in his specialized field, in cooperation one with the other, guide the people of America in all matters affecting their health and physical well being.

Pharmaceutical Education and the Public Health*

NATHAN B. EDDY, M. D.

Principal Pharmacologist, U. S. Public Health Service, Washington, D. C.

It is an honor, a privilege and a pleasure to participate in

*Read before the Session on Education, Centennial Celebration, School of Pharmacy, University of Maryland, Baltimore, June 4, 1941.

the centennial celebration of the founding of the University of Maryland School of Pharmacy, and my feelings on this occasion are not diminished by the fact that I was invited to attend as a representative of the United States Public Health Service. I have been associated with the Service for some time, first as a consultant and then as a member of its laboratory branch, the National Institute of Health, but never unfortunately, as a commissioned officer. Frankly, however, I am not an expert in pharmaceutical education, nor can I lay claim to great expertness in public health, but as a physician and a pharmacologist I would like to present for your consideration some thoughts on the conduct of pharmacy in relation to the public good.

You are all aware of the tremendous changes—advances for the most part—in the profession of medicine in the past 100 years. The same period has seen very great changes also in the profession of pharmacy. Many of these certainly have been of importance and benefit to the public at large and may truly be called advances. The benefit of others I would question, while there are still other changes which might have taken place which, I think, could be of value to both the pharmacist and his patrons.

Pharmacists are commonly sought advisers on physical ailments and in the past some of them have frequently recommended lines of treatment. With advances in medical education and pharmaceutical knowledge most of them have realized the inadvisability and often actual danger of such recommendations and for the most part have been wholeheartedly cooperative with what must be termed restrictive legislation. Indeed pharmacists have to an outstanding degree both initiated and fostered state and federal laws governing the manufacture, sale and distribution of drugs and medicines. A few are derelict in this as in any other profession, but most are aware that they are not physicians and do not attempt to play the physician's role. Nevertheless their advice is sought and they have the opportunity of useful service as able and tactful counsellors. They can discourage self-medication and urge the early seeking of trained medical aid. They can stress the importance of attention to early symptoms which, though apparently innocent, may indicate the first signs of a grave condition, cancer for instance. They can

impress upon the public that prevention is more important than cure and that the latter is greatly facilitated if effort toward it is initiated at an early stage. Tact and good sense on the part of the individual, if the means can be found to put into his hands the necessary information, can make of the pharmacist an important agent in preventive medicine.

There is one line in particular along which the advisory role of the pharmacist could and should be exploited, namely, in the field of venereal disease and its control. So often, for reasons of diffidence perhaps, the patient tries to find help for himself in this connection, and where better can he do this than through his local pharmacist. At a conference on social hygiene held in Chicago about a year ago Dr. DuMez discussed the cooperation of pharmacists in plans for the control of venereal disease. He recommended "*That special measures be developed to fully educate pharmacists with regard to the nature and purpose of the venereal disease control program; that pharmacists be supplied with display material which can be exhibited in their pharmacies and with literature for distribution to the lay public; that there be devised in cooperation with pharmacists an effective means to enable them to refuse to sell remedies for the treatment of venereal diseases without offending their patrons; and that there be developed in cooperation with pharmacists an effective routine for referring venereal disease cases to physicians and clinics whereby those thus referred will be assured of receiving adequate treatment.*" Giving full effect to these recommendations would help the pharmacist to help the public in a very significant manner.

One of the changes in pharmacy that I find it hard to look upon as an advance is the use of the drug store as a place for the display and sale of general merchandise. In the modern so-called drug store one has often to search for the drug department and prescription counter. Why can't we have what the name implies—a place devoted to the handling of drugs—and let the department store do the general business?

Again a regrettable change in pharmacy is the multiplication of preparations of identical or very similar character. Why, for example, must we be offered many products, each reputedly a preparation of vitamin B complex or why need

we have on the market barbital and veronal? Both are diethyl barbituric acid, and, therefore, pharmacologically identical, but we are supposed to believe that one is superior to the other. One could cite many other similar examples where one pharmaceutical manufacturer makes a standard preparation of a certain class and another produces the substance with just enough difference to avoid infringement of copyright and patent laws. In so doing I think the manufacturer is violating the public trust. The purchaser has no way of knowing that two or more products sold under different names are for his purpose, identical.

This multiplication of names for preparations which are the same in composition and intent is a difficulty which the pharmaceutical profession could and should do something about. In March of this year a hearing was held in Washington on the regulations under the Food and Drug Act, regarding habit-forming drugs. The purport of the regulations, protecting and advising the public of possible habit-forming properties, was not in question, but the hearing took about two weeks to complete because of the concern of the pharmaceutical manufacturers over the names of their own preparations. Such concern may have commercial significance but it is not in the public interest. I think that this is an instance where self-interest and desire for profit should not be allowed to dictate policy.

A solution would be cooperation of all concerned with a central body which would decide upon the name of a product—a name indicative of the nature of the product and available to all. Any new product would then have to be proved significantly different and better before it would be entitled to a new name. The Council on Pharmacy and Chemistry will on request cooperate in this way. Given the proper support it, or perhaps a group in the Pharmaceutical Association, could clarify the situation in regard to names and overlapping products.

Pharmaceutical manufacturers have come a long way in respect to standards for their products but there is still too much rivalry, too much desire to exploit one's own particular product, instead of striving for uniformity in the properties of the product which apply to the specific purpose for which it is intended. Drugs are not spades or hats where a difference

in size or shape or even composition is unimportant except as it meets the taste of the individual. A drug of a given composition for a specific purpose should always be given the same name and should be of absolutely uniform character insofar as our tests for purity make this possible. All parties concerned should cooperate to the fullest extent to bring this about.

Purity and uniformity are paramount requirements of an acceptable preparation and for these the pharmaceutical manufacturer must be responsible. Errors may occur but every precaution should be taken to prevent them or correct them in the shortest possible time if they do occur. One concern recently failed in the full performance of its duty when it allowed a considerable time to elapse between discovering a serious error and taking the fullest possible steps for its correction.

One other item in the conduct of the pharmacist I would like to discuss, one in which if he would take the initiative and carry through a program of reform, he could institute and continue a public service of tremendous importance. I refer to the attitude of the pharmacist toward advertising. The practice of pharmacy, of course, is dual in its nature; the pharmacist has to be a business man as well as a professional handler of drugs. However, in the latter capacity he has certain ethical standards as have other professional men, and especially his business deals with agents which are so frequently vital to the health and happiness of his patrons that ethics should not be subordinated to so-called business sense. Much pharmaceutical advertising today contains claims which are erroneous explicitly or implicitly. For the good of us all why can not the manufacturers who are largely responsible for advertising be guided by an unbiased advisory body (the same one perhaps to which we have assigned the question of names) to sift claims and see that they are stated clearly and unequivocally in accordance with all of the facts? Find the means to secure the opinion of our advisory body in every instance and let all pharmaceutical advertising be built up according to its principles and the profession of pharmacy will gain in dignity and respect in the minds and hearts of everyone and will take its true place as a responsible preparer, purveyor and advisor for the medical armamentarium.

Perhaps in these remarks I have seemed wholly critical but with each criticism I have tried to make a constructive suggestion and have tried to indicate some of the ways in which pharmacy can serve the public in as true and important respects as the medical profession itself. I think the changes suggested are practicable but if they are to come about the principles involved must be vigorously promulgated through the channels of education.

Colleges of pharmacy must have had in mind very high standards for themselves when they joined with the American Pharmaceutical Association and the National Association of Boards of Pharmacy in the creation of the American Council on Pharmaceutical Education. Upon its organization that body stated its objects to be, "*To formulate the educational, scientific and professional principles and standards which an approved school or college of pharmacy will be expected to meet and maintain; and to assist in the advancement and improvement of pharmaceutical education and registration.*" Thus in the American Council on Pharmaceutical Education it seems to me that we have the machinery ready at hand to initiate reforms in pharmaceutical practice smoothly and efficiently by insistence on appropriate pharmaceutical education.

The American Pharmaceutical Association long ago adopted a code of ethics from which the following is quoted:

"Pharmacy has for its primary object the service which it can render to the public in safeguarding the handling, sale, compounding and dispensing of medicinal substances."

"The pharmacist should hold the health and safety of his patrons to be of first consideration; he should make no attempt to diagnose or treat diseases or strive to sell drugs or remedies of any kind simply for the sake of profit."

"The pharmacist should be willing to join any constructive effort to promote the public welfare and he should regulate his public and private conduct and deeds so as to entitle him to the respect and confidence of the community in which he practices."

Let colleges of pharmacy insist in their teaching upon full thoughtful adherence to these principles and their graduates will be given the same confidence and respect in their field that the physician is given in his.

Pharmacy's Service to the Public*

HUGH C. MULDOON

Duquesne University, School of Pharmacy

Centuries ago, the armorial bearings of English apothecaries carried a Latin phrase that, translated, read, "Throughout the whole world we are called bringers of help." Pharmacists, today, might well revive the use of that motto for, continuing the English tradition, they, too, devote their lives to the helping of others. Universal pharmacy holds no political beliefs; it recognizes no national boundaries. No single people, no race, alone, receives its benefits.

But the modern pharmacist's role in the protection of the public health, the nature and extent and importance of the professional work he does, and the friendly personal services he renders, frequently are not appreciated at their true value. Why? Largely, because pharmacists are not good propagandists. They lack vigorous spokesmen. The profession suffers because of the reticence of the men who practice it, a characteristic that, in them somehow seems appropriate and commends them to those they serve.

Just now the public is becoming more intelligently interested in health problems, and more critical of the workers in all the health fields. They find pharmacy somewhat perplexing. It is definitely one of the health professions in which public welfare must be put before private gain. But, sometimes, we find drug store signs flaunted above bustling commercial establishments in which professional pharmacy appears to have little place. Pharmacy is a personal, not a corporate service. Those who conduct such misnamed "drug stores" are primarily merchants, not pharmacists. They exploit and discredit an honest profession. We question if to them the saving of life, the relieving of distress, and the preventing of disease are of paramount interest.

In contrast to the over-commercialized drug store we point out the small but increasing number of pharmacies devoted exclusively to professional practice. Of these we are

*Read at the Academic Convocation on the occasion of the Centennial Celebration of the School of Pharmacy of the University of Maryland, Baltimore, June 5, 1941.

rightly proud. But, most commonly as you know, pharmacy is practiced in shops of modest size, located in every village and in every neighborhood, places in which profession and business seem to be happily combined.

Once, the pharmacist manufactured. Now, he largely distributes. He works less with his hands than he did formerly, but he must know more. He is sensitive to public needs, and circumstances compel him to sell not only drugs and related products but also the small creature comforts that modern living demands. The merchandizing this kind of pharmacist does, however, is subordinated to his dispensing. In no way does it affect the soundness of his professional work.

When there is no distress or danger, we are inclined to think of the pharmacist as a business man, and the drug store as a place where reliable products are sold. But under the tension of illness our ideas change. Then we realize that the pharmacy is a health institution, and the pharmacist a responsible professional specialist who supplements the work of the physician by performing capably the exacting service that the physician requires. The pharmacist at his prescription desk knows full well that human lives rest in his hands. To the seriously ill man his work may be of supreme importance. The pharmacist performs his work calmly, efficiently, promptly. He is interested in the patient as well as in the prescription. He establishes in the sick a belief in his integrity, a trust in his skill and in the skill of the physician, and a reliance on the purity and strength of the drugs he dispenses. He allays many needless fears. He earns, and deserves, the respect and confidence of his patrons.

On high authority we are told that the well informed pharmacist is the best single individual to disseminate information about public health. This is true. Daily the pharmacist combats health ignorance and superstition by giving advice and counsel about simple matters of personal and community hygiene that properly come within the field. The information he provides is dependable, specific, practical, and free. Needed materials are close at hand. Careful always not to usurp the functions of the physician, the pharmacist serves the public well when he refuses to suggest treatment for conditions that should have a physician's attention. The pharmacist is expected to render temporary first aid in cases

of emergency. He knows what to do and what not to do. If he is so inclined he may prepare diagnostic reagents and make certain analytical and microscopic examinations. He is concerned with preventive as well as with curative measures. He knows much about antiseptics and disinfectants and sterilizing agents. His advice is sought in the control of insects and fungi and parasites. Frequently, as the only person trained in science who may be readily accessible, he serves as an interpreter of science to the community.

The pharmacist is more closely regulated by law than any other health worker. The many legal safeguards thrown around pharmacy indicate how keenly the state realizes the importance to the public of the proper practice of this profession. In return for legal protection, the state demands that pharmacists shall provide safe, competent, and modern pharmaceutical service. This they do. Pharmacists set and enforce high standards of pharmaceutical practice. They insist that only the best materials shall be used in diagnosis and treatment. They engage to provide only well educated and adequately trained pharmacists to serve the public. They do their best to protect the people at large against exploitation by patent medicine quacks. They guard against the indiscriminate sale of narcotics and poisons and other dangerous materials the use of which must be restricted in order to protect the public.

Since the pharmacist is regarded as an educated man, honest and high principled, his opinions and friendly advice are sought on a variety of non-professional subjects. To his sympathetic ears are brought many personal troubles. If he is resourceful, diplomatic, and wise, he may be of very real help. His numerous charities are never mentioned. His kindly human qualities draw him closer to the people of his neighborhood than any other single man, save possibly the clergyman. His very closeness to people is a measure of his success.

Especially in the smaller communities the drug store may become the neighborhood center where all the best minds congregate. Here the pharmacist's views on civic questions are invited and respected. Skillful and adept in social relationships, educated to be intellectually independent, and conscious of the duties of citizenship, the pharmacist may de-

cide to seek public office. Not a few have served as governors and mayors and members of state legislatures and on school boards and boards of health and in other offices. Washington has welcomed them in the House and in the Senate. One has even entered the Cabinet of a President.

Legislators with pharmaceutical backgrounds have been helpful in opposing dangerous and freak legislation. They have succeeded in obtaining the passage of numerous regulatory laws in the interest of public health, and consequently in the interest of pharmacy, for the two interests are identical. In this work the lawmakers have received the cordial support of organized pharmacy.

Pharmacy's organizations are responsible for every great advance the profession has made. Through cooperation these groups multiply by the total of their membership the individual's power to do good. They are active in many fields. Education, particularly, has always received their attention and aid.

Our colleges of pharmacy are fully conscious of their obligation to provide a modern program in the essential disciplines. They select for training recruits of character and ability, and inculcate in them worthy ideals and a sincere regard for the ethics of the profession. Some of these young men, students and graduates, are now undergoing a new experience. They do not subscribe to violent philosophies of life, but they are proud to be numbered among the many loyal citizens enrolled in our national Defense Forces. The lessons they learned during their college careers now serve them well.

Progress comes through discovery. Schools of pharmacy are concerned with productive as well as absorptive scholarship. The research accomplishments of a number of our colleges, and of workers in industry as well, are impressive. Advanced study in pharmacy is fast becoming a necessity. The professional work of the pharmacist grows and will continue to grow in importance. If he is to serve the public well, the practicing pharmacist must keep informed of modern trends. He must study without ceasing if he is to grow in knowledge as he grows in skill and richness of experience.

New days will bring new duties, but pharmacists will always remain our reliance in illness and our convenience in health. Alert to conditions within and without the profes-

sion, they will strive to perfect and extend their usefulness. They are engaged in an essential social service. It is their duty, therefore, ever to become more efficient and more kindly "bringers of help" to all mankind.

Pharmaceutical Education from the Standpoint Of the Physician*

ELMER B. FREEMAN, M.D.
Baltimore, Maryland

Pharmacy, the art of preparing, preserving, and compounding drugs in accordance with the physician's orders, naturally bears a very close relationship to the practice of medicine. In fact, the relationship is so close that whatever influences one, likewise influences the other.

Progress in pharmacy and medicine is greatly influenced by the basic sciences, especially pharmacology, physiology, chemistry and biochemistry. In all these special fields, an enormous amount of experimental work is being done, many new products are being produced, and some of these will ultimately find a useful place in the practice of medicine. While very rapid strides have been made in the past few years, I, for one, am of the opinion that just as rapid strides will be made in the immediate future, provided rugged individualism is not destroyed, and the scientist in every line of investigation is permitted to follow his own course in his own way without interference from any source.

It is not within the province of this paper to more than briefly discuss a few of the great advances in pharmacy and medicine that have been most beneficial to mankind. Certainly it cannot be amiss to briefly discuss such outstanding achievements as,—small pox vaccine for the control of small pox; arsphenamine in the treatment of syphilis; typhoid vaccine for the control of typhoid fever; diphtheria antitoxin in the treatment of diphtheria; insulin for the control of diabetes; pneumococcus serum and chemotherapy in the treat-

*Read before the Session on Education at the Centennial Celebration of the School of Pharmacy of the University of Maryland, Baltimore, June 5, 1941.

ment of lobar pneumonia; liver extract in the control of primary anemia; and vitamins in nutritional disturbances.

Small pox has been almost completely eradicated by compulsory prophylactic vaccination.

The cause of syphilis was discovered in 1905. One year later, Wassermann discovered the biologic reaction that now bears his name. Ehrlich conceived the idea that it might be possible to find some chemical that would kill the invading organism and at the same time not injure the host. After many, many trials and repeated failures, to be exact, 605, he finally succeeded in producing arsphenamine, or salvarsan, or 606, which when given intravenously would destroy the *Treponema pallidum*, and if carefully given, was quite free of danger,—a cure for syphilis had been discovered, and another terrible disease had been overcome.

When one recalls the frequency of typhoid in years gone by and compares that frequency with the rarity of the disease at the present time, one is amazed at what has been accomplished. I recall as an intern, having forty cases of typhoid fever on the medical service at one time. Now typhoid is a rare disease, and seldom does one see a case. The larger hospitals may have one, or two, or three cases a year. This decided change in the frequency of the disease has been brought about by the prophylactic use of typhoid vaccine.

The dread disease diphtheria that caused so many deaths among children, has yielded to diphtheria antitoxin. Now certain protective procedures, which when properly carried out, prevents those treated from contracting the disease. One needs to see only one case of malignant diphtheria to realize what has been accomplished in this disease. Likewise, tetanus or lockjaw may be prevented by the free use of antitetanus serum in puncture wounds or where laceration of tissue has occurred.

The discovery of insulin by Banting revolutionized the treatment of diabetics. With a properly selected diet and a carefully regulated dose of insulin, the diabetic may be made to feel well and to live out his normal expectancy of life. When one considers that in the United States alone there are more than a million diabetics, it becomes very apparent what this discovery has meant and continues to mean to the social and economic life of the nation.

It has only been in the last few years that any real

progress has been made in the treatment of pneumonia. For many years past, one type of treatment after another was tried in a vain effort to find something that would combat pneumococcus infections. At one time, the patient with pneumonia was kept in a closed room without any ventilation whatsoever, the idea being that he should not be exposed to cool fresh air for fear of taking cold and thus reducing his chances of recovery. Still the mortality rate remained unchanged. This failure was followed by another absurd idea that the pneumonia patient should be placed in a room without any heat with the windows kept open at all times. This idea of the superabundance of fresh air was not quite so absurd as the closed room procedure, but the end results were the same; and the mortality rate still remained unchanged. At this time, there were no drugs that had any real virtue in controlling the infection. Symptomatic treatment was given with the hope that the patient himself would develop enough resistance to the infection to overcome it.

Not until the classification of the pneumococcus into the different types first the 1, 2, 3 and 4, and later into many types, did real progress in the treatment of lobar pneumonia begin. This classification led to the development and use of pneumococcus serum, which in certain types of pneumonia gave very gratifying results, but not satisfaction in all types. The serum treatment was followed by chemotherapy with a group of drugs closely related to sulfanilamide which has been followed by very satisfactory results. In some cases, however, better results are obtained by chemotherapy combined with pneumococcic serum. Since the introduction of chemotherapy and serum therapy, the mortality rate has been greatly reduced.

While primary anemia or pernicious anemia has been known for many many years, no real advance in treatment occurred until Murphy and Minot tried feeding pernicious anemia patients large amounts of fresh liver. This was followed by marked improvement, and with the feeding of one-half pound of fresh liver daily, the symptoms rapidly disappeared and the blood markedly improved. In fact, the blood when studied under the microscope appeared to be normal. It was also discovered that when the feeding of liver was discontinued, the anemia with all its symptoms returned. During the experimental stage of the treatment it was also found that one large feeding of liver would likewise give good results.

Bloomfield fed ten pounds of liver, a quantity sufficient to last the patient for twenty days if given in half-pound daily amounts, as rapidly as the patient was able to consume that amount, usually in two or three days, and found that the same result could be obtained as obtained by daily feeding. As a result of these feeding experiments, liver extract is now available in a very concentrated form both for the administration by mouth and parenterally. In many cases it is only necessary to give liver extract parenterally once every two to four weeks. Pernicious anemia has been conquered—liver extract keeps the patient well, and he should, as far as the anemia is concerned, live out his normal life expectancy.

In recent years, vitamins have been used in nutritional disturbances and in diseases attributed to long continued food deficiencies. It is estimated that a very large per cent of those in the low income brackets suffer nutritional disturbances. There is also another factor to be considered, namely, the super-refined quality of some of our foods. In the refining process some of the important ingredients are removed. While the more refined foods are probably more palatable, the food values have been very much lessened. This holds true especially for bread—whole wheat bread being very much more nutritious than white bread. There is no doubt that certain vitamins are of great value in the treatment of certain diseases, but in many diseases vitamin deficiency is not a causal factor. It is very unfortunate that vitamins have been so exploited that everyone has become vitamin-conscious, with the result that many times the vitamins are being taken when not indicated. In some diseases, vitamins may do more harm than good—the promiscuous use of vitamins is to be condemned. A well regulated liberal diet is still the best way to acquire the necessary amount of vitamins.

Those of us practicing medicine owe a great debt of gratitude to the manufacturers of pharmaceutical products, for it is they who supply us with necessary drugs and many other substances in a form that may be given to the best advantage in combating disease. The scientific investigators in the field of pharmacology, physiology, chemistry and biochemistry make the discoveries and the necessary studies to determine whether a new discovery is of any value in preventing or combating or curing disease, but it is the manufacturer of pharmaceuticals who gives us the finished product.

In recent years several substances have been obtained from certain gland and from certain body secretions that are now being used successfully in the treatment of disease. In the way of illustration, there has been very recently isolated, a substance called urogastrone, which has been obtained from the urine of both dog and man, and which, when administered parenterally, inhibits gastric secretion. According to John S. Gray, less than one milligram representing the amount obtained from less than one quart of urine will inhibit the dog's gastric secretory response to histamine. The purified product has been shown to be without effect on blood pressure or body temperature. The fact that this substance is able to lessen gastric secretion may be of great value in the treatment of peptic ulcer and other conditions where it seems desirable to lower gastric acidity for a period of time. New substances are continually being produced, some of which will, after careful investigation, find their place in the treatment of disease.

The making available in proper form for administration, must be done by the manufacturers of pharmaceutical preparations. With all the splendid things that the manufacturers of pharmaceutical preparations have accomplished, it seems rather disappointing that they have seen fit to bring their products out under trade names. By so doing, the same substance is presented to the practicing physician for his approval by as many names as there are manufacturers of the product. Not only are the newer preparations presented in this way, but many drugs that have been used for many years with good results are being combined with other drugs and presented in like manner. These preparations apparently do not give any better results when given in these forms than those found in the National Formulary and the United States Pharmacopoeia.

By way of illustration, there are three preparations of digitalis in common use,—the powdered drug, the tincture, and the infusion. Each has its place in the treatment of heart disease. Yet there are many, many trade-name preparations of digitalis which one may select from. Each, according to its manufacturer, is superior to any other similar preparation that is made by a competitor. About ten years ago, one of the leading physicians in Boston collected samples of the tincture of digitalis from twenty-seven pharmacies in Boston

and vicinity. These samples were taken to the physiological laboratory of the institution with which he was connected. They were all found, after careful testing, to be physiologically active. The samples collected must have represented a number of different manufacturers, yet they all tested out almost alike. At the present time, one must confess that so many pharmaceutical preparations are being brought out under trade names that it is very confusing. To some practitioners, it is so confusing that they practically never use any proprietary preparations.

The relation between the pharmacist and the practicing physician should be one of very close cooperation. The physician must depend on the pharmacist not only for the compounding of his prescriptions in accordance with his directions, but he must rely upon him for the quality and freshness of the drugs used. When a physician is asked back of the prescription counter and he finds everything in order,—the various containers of drugs nice and clean, bottles properly corked, other drug containers properly closed, the scale clean and well protected against dust, the actual compounding counter clean and not cluttered up, he feels that he is in the type of pharmacy where he would like to have his prescriptions compounded. On the other hand, if the drug containers are dusty, some of the bottles uncorked, other containers not properly closed, scales not clean and protected from dust, the compounding utensils not clean and the compounding counter all littered up, naturally, he feels that he cannot permit his prescriptions to be compounded in such a pharmacy.

A few months ago I gave a prescription to a patient who took it to a certain pharmacy. Being anxious to see how prescriptions were compounded, he asked the pharmacist if he objected to his watching him fill the prescription. The pharmacist gladly consented and invited the patient into the prescription department. Everything in the department was so very untidy that the patient refused to take the medicine compounded by that pharmacist and returned to the office and obtained another prescription and took it elsewhere to be filled.

About a year ago I was called to see an elderly pharmacist in consultation with his regular physician. His pharmacy was modestly furnished, but everything was very orderly and clean; no merchandise was carried except sick room requisites.

While there I was asked if I would like to see his library. It was a real treat to see what a wonderful collection of books pertaining to pharmacy it contained. The library referred to is the Kach library, which is now in the possession of the School of Pharmacy of the University of Maryland.

Within the last year, I was in a West Virginia city of about thirty-five thousand. I was asked by the physician with whom I was stopping to visit one of their modern pharmacies. It was scrupulously clean and everything was in order. The prescription department was all that could be desired, and connected with it was a small library room fitted up for physicians, which contained reference books pertaining to pharmacy and an index system for filing the new trade-name preparations that are multiplying so rapidly—more pharmacies of the last two sorts just discussed would be very helpful to the general practitioner.

For many years, there has been a growing tendency for pharmacists to add all sorts of mercantile items to their stock of drugs and sick room supplies. Some of the pharmacies at the present time have more the appearance of a department store than that of a pharmacy. The compounding of prescriptions and the sale of sick room supplies are more or less side-lines and not the main reason for their existence. In the United States, the term pharmacy and drug store are used synonymously. Would it not be better to reserve the name pharmacy for those stores that direct their entire efforts to the preparing and preserving of medicines and the compounding of prescriptions in accordance with the physicians' orders and to the sale of sick room requisites? The term drug store could be used to designate those stores that handle other lines of merchandise in addition to sick room necessities and only compound prescriptions as a minor part of their service.

On entering some pharmacies, one may see numerous special announcements concerning the various remedies compounded by that pharmacy, such as,—headache capsules, cold capsules, cough syrups, *etc.* The announcements are in a quiet way inviting the public to try their remedies if and when it may seem expedient to do so. The pharmacist, however, should remember when prescribing across the counter that every headache is not due to acid indigestion—it may be due to severe eye strain, acute sinusitis, high blood pressure, tumor of the brain, or to many other serious diseases. That every

cough is not due to a simple upper respiratory infection or common cold should be borne in mind—it may be due to pulmonary tuberculosis, or to heart failure, or other serious conditions. That acid indigestion or sour stomach is not always due to an increased acidity of the stomach is an important fact—it may be due to peptic ulcer or to cancer of the stomach. Many other instances could be cited, but these three are amply sufficient to illustrate the point under consideration, namely, that very different conditions calling for very different types and modes of treatment can at times give rise to similar symptoms which the pharmacist is not qualified to diagnose and treat.

There can be no doubt concerning the fact that the pharmacist is not entirely at fault many times for prescribing over the counter. The family physician and the manufacturer of pharmaceuticals are likewise to blame. The family physician is especially to blame in two ways, namely: First, by telling the patient to go to the drug store and purchase certain preparations, especially tablets or pills, and take one of these three or four times a day, secondly, by giving out samples of manufactured trade name preparations, and directing the patient to take the medicines according to the directions thereon. If the patient who is sent to the drug store to purchase the medicines or is given a trade name preparation by a physician in his office obtains relief from the preparation, the next time he feels badly or has a headache he will go direct to the drug store and procure more of the same under the trade name, simply because he remembers and knows that he was relieved from a similar condition before, but having no proof that it is the same thing. It is quite likely, he will be able to purchase what he wants over the counter under its trade name. To my knowledge, such potent drugs as thyroid extract and digitalis have been purchased over the counter. This is very unjust to the purchaser, for as a rule, the purchaser is not familiar with the physiological properties of the drug he has purchased. Certainly one should not take thyroid extract or digitalis unless he is under the direct observation of a physician. The manufacturers of pharmaceutical products also are to some extent responsible for the counter prescribing, in that most manufacturers, if not all, bring out the manufactured products under trade names in all sorts of different colored capsules, different colored pills and with

different colored labels, all of which helps to identify the trade name of the product and to make the dispensing of drugs and pharmaceuticals less subject to the physician's order. These all aid in making it much easier to purchase over the counter. After all, the pharmacist, the manufacturer of pharmaceuticals, and the physician, all three, must share alike in the responsibility for counter prescribing.

While pharmacology, physiology, chemistry and biochemistry are making rapid strides and many new products are being produced, and while the manufacturers of pharmaceuticals are giving us many new finished products based on the discoveries made in the scientific laboratories, the present day pharmacy apparently has not kept pace with the scientific laboratories and the manufacturers of pharmaceuticals. There is a feeling among many physicians that the pharmacy of today is not the equal of the pharmacy of some years ago. This no doubt, is in part due to the fact that in many pharmacies of today, the fundamental reason for existence is not the sale of sick room requisites or the compounding of prescriptions. It is hoped that we may have many more pharmacies that have as their major interest the supplying of sick room requisites and the careful compounding of prescriptions.

I have discussed for you, very briefly, some of the newer remedies used in modern therapy, for the purpose of directing attention to the diversity of their nature. I have also referred to certain conditions in pharmacy which physicians do not approve of. Modern therapeutic agents are in the main, complex organic compounds isolated from natural products or prepared synthetically. In either case, special knowledge and skill are required for their production and standardization, and for compounding them into preparations suitable for administration to human beings. Physicians expect you as pharmacists to perform these functions. In addition, we expect you to exercise such control over the distribution and sale of these products as is necessary to prevent improper use. The particular kind of education and training which a pharmacist should have to enable him to perform these functions satisfactorily, is a subject upon which I am not qualified to express an opinion. I will say, however, it is my belief that the pharmacy curriculum should be sufficiently broad and thorough to prepare those who complete it,

to render efficient pharmaceutical service, and to imbue them with a proper appreciation of the dignity of their calling.

Chemistry's Debt to Pharmacy and Pharmacists*

ARTHUR E. JAMES

Temple University, School of Pharmacy

Introduction

In the teaching of any subject a knowledge and appreciation of its historical background is decidedly a valuable adjunct. Especially is this true of the science of chemistry, which, in addition to playing such a vital role in the health, commerce, and industry of contemporary life, has an unusually fascinating historical background. For those of us who are concerned with the teaching of chemistry in colleges of pharmacy there is a unique and fruitful opportunity to call attention to the significant contributions which pharmacy and pharmacists have made to the development of the science of chemistry.

While pharmacy has sometimes been referred to as the "mother of medicine," with equal appropriateness it may also be called "the cradle of chemistry." Paracelsus, that explosive and peripatetic personality of the early sixteenth century, proclaimed that "the business of alchemy was not to make gold but to prepare medicines." From the chemistry of that day until the present time there has been an ever increasing emphasis upon this thesis.

One of the temptations which confronts writers on pharmaceutical history is the danger of seeking prestige by claiming individuals whose relationships to pharmacy have been incidental or else for a very short duration of time. In this paper attention will be called to these facts when discussing such borderline individuals. On the other hand, all too frequently chemical historians have failed entirely to mention pharmacy in connection with the discoveries of eminent chemists whose initial scientific training was in pharmacy or whose work was carried out while they were engaged in this profession.

*Read before the Conference of Teachers of Chemistry at the 1941 meeting at Detroit.

Chemical Contributions by Early Apothecaries

Johann Rudolph Glauber (1604-1670) was born in Carlstadt, Germany. While he was not trained as a pharmacist, his extensive contributions to this field, as well as the fact that he managed the court pharmacy at Giessen¹, warrant his inclusion here. From the water of a Hungarian spring he obtained sodium sulfate, the salt which bears his name, "Glauber's Salt." He made extensive claims for its curative properties. In addition to selling many secret medicinal preparations he was an ingenious experimenter. His "Pharmacopoeia Spagirica" of 1646, and other publications had a marked influence on the chemical development of his time.

In 1672, a French apothecary named Peter Seignette, while living in the city of Rochelle, discovered the compound since known as "Rochelle Salt." Upon finding that it possessed laxative properties Seignette advertised and sold it as "the salt of many virtues." Its composition was kept secret by the Seignette family for sixty years.

From the viewpoint of influence on chemistry perhaps the most prominent person of the seventeenth century was the apothecary-chemist-physician, Nicholas Lémery (1645-1715). This influence was the result of the lectures which he delivered at his popular pharmacy in Paris and of his textbook entitled "Cours de Chimie." This book was translated into Latin, English, Dutch, German, and Spanish and was one of the books studied by Scheele. Lémery also wrote a treatise on antimony and a Universal Pharmacopoeia which were widely used. He was the first chemist to differentiate and classify substances under the headings of vegetable (organic) and mineral (inorganic) chemistry.

Valentine Rose Sr. (1735-1771), a Berlin pharmacist and chemist, is noteworthy as the discoverer of the fusible alloy, "Rose Metal," containing bismuth, lead, and tin. Both his son, Valentine Rose the Younger, and his grandson Heinrich Rose were distinguished chemists and pharmacists.

While it is not within the scope of this paper to enumerate all the contributions to chemistry made by that brilliant and energetic Swedish pharmacist, Karl Wilhelm Scheele (1742-1786), it may be appropriate to list a few of the compounds which he discovered. He differentiated nitric and nitrous

¹ 1644 for about one year.

acids. He discovered glycerine and the following array of organic acids: lactic, mucic, tartaric, benzoic, oxalic, uric, citric, and gallic. In his work with the compounds of arsenic he prepared the well-known pigment which bears his name, "Scheele's Green" (copper arsenite) and the deadly gas arsine. His contributions to science, all of which were achieved while he was engaged as a pharmacist, set him apart as the "superman of pharmacy," yet his life was cut short when he was only forty-four years old.

Contributions to Chemical Theory

Only a few years ago the charge was made that pharmaceutical education was merely the memorization of factual material. In view of today's emphasis upon an understanding of the theories underlying methods used in pharmacy it is both inspiring and challenging to realize that pharmacists have made valuable and significant contributions to the development of chemical theory.

Stephen Francis (Etienne Francois) Geoffroy (1672-1731), usually designated as "Geoffroy the Elder," was the son of a Parisian apothecary in whose store scientific meetings were held which led to the birth of the Paris Academy of Science. Stephen Geoffroy and his brother, Claude Joseph (1685-1752) known as "Geoffroy the Younger" received an exceptionally good education in the science of their day. In addition to these brothers, the son of Claude Joseph, Claude Francis Geoffroy, known as "Geoffroy the Son" distinguished himself as a chemist and was the author of a famous dissertation on bismuth. In referring to "Geoffroy the Elder" LaWall says that "from first to last he was a retail pharmacist, although few historians of chemistry even mention the fact of his connection with pharmacy. "He studied pharmacy at Montpellier and later graduated in medicine in Paris. In 1698, he visited London and was made a member of the Royal Society there. He held professorships of pharmacy and medicine in the College of France and was physician to the King of France. His major contribution to chemical theory was his Tables of Affinity in which he attempted to define specific relationships between different elements and compounds. Although he failed to take into consideration the roles of temperature, pressure, solubility, and the nature of the solvent, his affinity tables were of value in collating chemical

facts, and had a decided influence on contemporary chemical thought.

Another French pharmacist and eminent chemist, William Francis (Guillaume Francois) Rouelle (1703-1770), is noteworthy as the author of the first clear definition and classification of salts. He defined a salt as the product of the action of an acid with a base and classified salts as neutral, acidic, or basic. Rouelle taught chemistry at the College Mazarin in Paris where Lavoisier was one of his students. In his earlier years Rouelle worked in the pharmacy that once had been owned by Lémery, but subsequently he established his own store. His brother, Hilaire Marie Rouelle (1718-1778), is equally well-known as a chemist-pharmacist and is to be remembered for his discovery of urea, of hippuric acid, and for recognizing the presence of iron in human blood.

Pierre Bayen (1725-1798), a French pharmacist, was active in the overthrow of the phlogiston theory. In 1774, he read a paper before the Paris Academy of Science in which he reported that an "elastic fluid" escaped when he heated mercuric oxide leaving mercury as a residue. While he failed to recognize this "elastic fluid" as an elementary substance, he did observe that the loss in weight of the oxide was just equal to the weight of the gas produced. He interpreted this phenomena correctly and used it as evidence against the phlogiston theory which was so widely accepted at that time. Bayen organized French military pharmacy in which service he spent a number of years.

According to Kremers and Urdang, Joseph Louis Proust (1754-1826), the well-known French chemist, was also a pharmacist. As the result of his painstaking experiments he may be regarded as the discoverer of the Law of Definite Proportions. When teaching chemistry in Madrid he began his famous yet courteous controversy with his fellow-countryman Claude Louis Berthollet. This classic controversy, in which Proust brilliantly defended and experimentally proved the validity of the law of definite proportions, lasted for nearly eight years and won for him recognition as an able chemist. As a result of this work mixtures and compounds were clearly differentiated for the first time. He called attention to the difference between the oxides and hydroxides of the metallic elements. In fact, he is credited with the discovery of the hydroxides.

Döbereiner's attempt to classify the elements in groups of triads was one of the most significant formulations in the realm of chemical theory during the early part of the nineteenth century. This work, published in 1829, was the forerunner of and an important step in the evolution of the periodic classification of the elements. That Johann Wolfgang Döbereiner (1780-1849) may be claimed, in part at least, by pharmacy, is evidenced by the fact that he worked in several pharmacies during his youth and for a period of thirty-nine years was professor of chemistry, pharmacy, and technology at Jena. His intimate friendship with the poet Goethe, for whom he carried out a number of chemical investigations, has but recently received attention. In connection with these studies Döbereiner became interested in the phenomenon of catalysis and especially in the catalytic properties of platinum. He was the first person to prepare sulfur trioxide by passing sulfur dioxide and air over platinum. Indeed, he may appropriately be called the father of the contact sulfuric acid industry. The Döbereiner lamp for the spontaneous ignition of gaseous hydrogen, when impinged upon platinum black, was a widely used exhibit of the phenomenon of catalysis for half a century. The many books and papers dealing with pharmaceutical chemistry which Döbereiner wrote are a testimony to his energy and ability.

Elements Discovered or Isolated by Pharmacists

One of pharmacy's major honors is the array of brilliant investigations in connection with the discovery and isolation of new elements which came from the pharmacy laboratories of Europe during the late eighteenth and the early nineteenth centuries. Owing to the fact that the publication of experimental work sometimes was delayed several years after the work had been accomplished, and in view of the limited facilities for the exchange of scientific data, it is not surprising that conflicting claims for priority are often encountered. However, the fact that independent investigators, unaware of the work of each other, made the same discovery should not detract from the honor and lustre due each individual.

Oxygen

From the viewpoint of the calendar the first element to be discovered was, appropriately, the most abundant one in nature, oxygen. It was isolated in a little apothecary shop in

Göteborg, Sweden, by the "Superman of Pharmacy," Karl Wilhelm Scheele, in 1772. However he did not recognize it as an element nor did Joseph Priestly, the English clergyman, who independently discovered it two years later. The name of this element was given to it by the illustrious French chemist, Lavoisier, who unfortunately gave it the name, oxygen, signifying "acid former." The true nature of acids was not understood until a later date.

The Halogens

Since the halogen derivatives are so extensively used as therapeutic agents, it is a happy circumstance that pharmacists played such a vital role in the discovery of the halogens. In 1774, by treating manganese dioxide with hydrochloric acid, Scheele discovered a new gas which he called "dephlogisticated marine acid." As in the case of oxygen, he was not aware of its elemental nature. Indeed, it was not until 1810 that Sir Humphry Davy clearly proved its elementary character and named it chlorine, the Greek for "greenish-yellow."

The second halogen to be discovered, iodine, was isolated by the French pharmacist, Bernard Courtois (1777-1811). He was the son of a saltpeter manufacturer and thus grew up in a chemical environment. After spending three years as an apprenticed pharmacist in Auxerre, he studied chemistry in Paris under Fourcroy and became an ardent experimentalist. For a time he served as a pharmacist in the military hospitals of his country. His discovery of iodine was the result of treating the ashes of marine algae with sulfuric acid. The clouds of violet vapors which soon condensed as dark lustrous crystals as a result of this procedure led Courtois into a study of the reactions of this new substance. The proof that iodine was an element was simultaneously announced by Davy in England and by Gay-Lussac in France. Each of these chemists have been credited with naming the element, iodine, from the Greek signifying "a violet color." In 1831, Courtois received the Montyon Prize of six thousand francs from the Royal Academy for "having improved the art of healing."

Following the discovery and proof of the elementary nature of chlorine and iodine it is not surprising that bromine, another member of this family of elements, was discovered, as their compounds are closely associated in nature. Bromine was isolated by the French pharmacist, Antoine Balard (1802-

1876) in 1826. Balard's early years were spent in Montpellier where he was graduated from the School of Pharmacy. His discovery of bromine was the result of efforts to find a use for the waste liquors from Mediterranean salt brines. He isolated a red liquid by saturating some of this brine with chlorine and distilling the mixture. This red liquid proved to be a new element which was soon named bromine, meaning "bad odor." Balard's discovery of this element when he was only twenty-three years old brought him unusual opportunities and wide recognition. He taught in Montpellier for a short time and then went to Paris to teach at the Ecole Normale, where Pasteur once served as his assistant. Later he held professorships at the Sorbonne and at the College of France. In addition to the discoveries of bromine, hypochlorous acid and amyl nitrite, he devised industrial methods, which were used extensively for the extraction of salts from sea water.

The history of attempts to isolate the other halogen, fluorine, is a tragic one which bears witness to man's insatiable curiosity as well as to the poisonous properties and the activity of hydrogen fluoride and of fluorine. Pharmacy's claim for a part in this history begins with the work of Andreas Sigismund Margraff (1709-1782), an illustrious German chemist and apothecary, who described hydrofluoric acid in 1768. Scheele worked with this acid a few years later and suffered from its poisonous properties. It was not until 1886 that the element was definitely isolated by Henri Moissan (1852-1907) in his laboratory at the Ecole de Pharmacie in Paris.

Klaproth's Work

Martin Henrich Klaproth (1743-1817), the most outstanding chemist of his generation in Germany, was active as a pharmacist during the major part of his career. In 1810, when he was sixty-seven years old, he accepted the chair of chemistry at the founding of the University of Berlin. Although his name is associated with the discovery of several elements, he did not isolate any of them in the pure state.

In 1789, Klaproth recognized the presence of a new metal in pitchblende. He named it uranium in honor of the planet Uranus, which had recently been discovered by Sir William Herschel. For more than fifty years chemists believed that Klaproth's product was pure uranium, but in 1841, Peligot

proved that it was an oxide and succeeded in preparing the pure metal. This error is not surprising in view of the fact that it is impossible to reduce uranous oxide by either hydrogen or by carbon. Peligot's metal was obtained by reducing uranous chloride with potassium.

In the same year in which he announced the discovery of uranium, Klaproth detected a new element in a mineral specimen from Ceylon. He named this element zirconia which was soon changed to zirconium. This discovery was one of the many tributes to his skill as an analyst as several contemporary chemists had analyzed the same mineral but had failed to recognize the presence of a new element. Zirconium, like uranium, is a very difficult element to isolate in the free state. Klaproth's contemporary, the eminent Swedish chemist Berzelius, prepared nearly pure zirconium, but it was not until 1914 that the pure metal was obtained.

The discovery of the element cerium was announced almost simultaneously in 1803 by Klaproth, by Berzelius, and by Hisinger. This metal is also most difficult to obtain in the pure condition. The first really pure metal was prepared at the University of Wisconsin in 1911, by using electrolytic methods followed by amalgamation and distillation.

In 1895, Klaproth rediscovered and named an element titanium, which had been found a few years earlier by Reverend William Gregor of England. Gregor's work was so modestly presented that it did not receive attention until Klaproth duplicated it. Klaproth also confirmed the discovery of tellurium and named it. His many mineral analyses and his chemical dictionary greatly advanced and enriched analytical chemistry.

Vauquelin's Work

In France, Nicolas Louie Vauquelin (1763-1829) was Klaproth's most conspicuous contemporary as a skilled analyst. Vauquelin's roots were in pharmacy. At the age of fourteen he started to work in a pharmacy in Rouen and later upon going to Paris spent three years working in different pharmacies. The owner of one of these pharmacies brought him to the attention of the leading chemists of Paris under whose tutelage his unusual abilities were given opportunity for development. In 1897, while Professor of Assaying at the School of Mines in Paris, he discovered and isolated chromium,

one of the elements which is of such strategic importance in today's industrial and military activities.

The year following his discovery of chromium, Vauquelin found a new earth in samples of emerald and beryl sent to him by the French mineralogist, Hauy. Since compounds of this element are sweet, Vauquelin named it glucinum. However, this name did not meet with favor, and the element is generally known as beryllium. Vauquelin is one of the most colorful illustrations of a talented individual whose early opportunities and training were enhanced by pharmacy. His influence on analytical chemistry has been of lasting value.

The Discovery of Other Elements

In addition to oxygen and chlorine Karl Wilhelm Scheele is accredited with the discovery of molybdenum and tungsten. In 1778, he demonstrated that graphite and the mineral "molybdenite," whose physical appearances are very similar, are different substances. Upon treatment with nitric acid the molybdenum mineral produced sulfuric acid and an unusual white solid which Scheele named "molybdic acid." His friend and fellow-countryman, Peter Jacob Hjelm, soon isolated elemental molybdenum by reducing molybdic acid with carbon.

Three years after his announcement of molybdic acid Scheele reported the discovery of an oxide which he called "tungstic acid." The mineral from which he isolated this oxide is composed of calcium tungstate and is now known as "Scheelite" in recognition of Scheele's work. He suggested a method for the preparation of the element tungsten by treating the tungstic acid with charcoal. The suggestion was made to and successfully carried out by the d'Elhuyar brothers, Spanish chemists, who had visited Scheele at his home in Sweden. The d'Elhuyar brothers also found this same element in the ore known as "Wolframite" and hence the symbol, W, for tungsten. These two elements, molybdenum and tungsten, are of indispensable importance in today's industrialized civilization.

The discovery of cadmium was the direct result of the influence of pharmacy. In 1817, Friedrich Stromeyer (1776-1835), a German physician, was serving as Inspector-general of the Hanoverian apothecary shops. The Hanoverian Pharmacopoeia required that a certain preparation contain zinc oxide, but Stromeyer found that instead it contained the

carbonate of zinc. In checking with the manufacturer he learned that the carbonate was used because it turned yellow when heated to produce the oxide. In seeking to find the cause of this yellow color Stromeyer found that it was due to the oxide of a new metal, cadmium, which he succeeded in isolating. Cadmium was also isolated by three other independent workers.²

The discovery of the elements boron and aluminum were each influenced by pharmacy. Louis Jacques Thenard (1777-1857), the French chemist, is classified as a pharmacist by LaWall. While this claim scarcely seems justified the influence of Vauquelin upon Thenard's career does give pharmacy tangible basis for credit. In collaboration with his fellow-countryman Gay-Lussac, Thenard isolated boron in 1808 and in addition clarified ideas relative to the composition of boric acid. Thenard's preparation of barium peroxide led him to the discovery of hydrogen peroxide when he treated the former substance with hydrochloric acid. For many years he and Gay-Lussac were engaged in chemical research at the Ecole Polytechnique in Paris where they both taught.

About the middle of the eighteenth century the German pharmacist Margraff proved that alum contained a base differing from all others then known. The first person to succeed in isolating aluminum was the well known Danish physicist, Hans Christian Oersted (1777-1851). Oersted spent his boyhood assisting in his father's pharmacy and later managed a pharmacy in Copenhagen where he took his medical degree. In 1825, he isolated aluminum by treating its chloride with potassium amalgam and distilling off the mercury. Three years later Friedrich Wöhler, the noted German chemist, obtained aluminum by a somewhat similar method.

Pharmacy's claim upon Sir Humphrey Davey (1778-1829), the brilliant English chemist, who isolated sodium, potassium, calcium, strontium, barium, and magnesium, is a mooted question. Some historians claim that his apprenticeship to the surgeon, John B. Berlese, at Penzance in Cornwall cannot be credited as an influence of pharmacy. Others, however, claim that Bingham Borlase was an apothecary as well as a surgeon and place emphasis upon the pharmaceutical

²One of those Cadmium discoverers was the apothecary K. S. L. Herman (1765-1846), who published his discovery before Stromeyer.

training Davy received during the three years he assisted Borlase in the preparation of medicinal products.

While no one can be credited with the discovery of carbon, since it is one of the elements known since antiquity, a few facts concerning it and its properties are worthy of emphasis here. Scheele proved that graphite is a form of the element carbon this being one of the first discoveries of allotropism. The unusual adsorptive properties of carbon were observed by early pharmacists. Tobias Lowitz (1757-1804), a Russian pharmacist* discovered the decolorizing and the deodorizing powers of vegetable charcoal in 1785. The German apothecary Karl Hagen (1749-1829), professor of chemistry and physics at the University of Königsberg, observed that the adsorptive properties of carbon are a physical property. The potent antidotal powers of charcoal were strikingly demonstrated before the French Academy of Medicine by the pharmacist Tuéry. He swallowed a gram of strychnine without deleterious effects due to the fact that he had previously ingested fifteen grams of charcoal.

Alkaloidal Chemistry

The contributions of pharmacy are nowhere more conspicuous than in the area of alkaloidal chemistry. Indeed, this was the outstanding pharmaceutical development during the early decades of the nineteenth century. In 1805, when he was only twenty-two years old, Friedrich Wilhelm Serturner (1783-1841), a pharmacist of Einbeck, Germany, published a paper dealing with the somniferous principle in opium. Ten years later he announced the discovery of the first alkaloid or "vegetable alkali," morphine, which he had isolated in crystalline form. Within ten years after this announcement intensive efforts to isolate active principles in vegetable drugs led pharmacists to the isolation of ten new alkaloids.

Excelled, perhaps, only by Scheele, the Parisian pharmacist, Joseph Pelletier (1788-1842) made the most brilliant contributions to scientific knowledge which have ever come out of a pharmaceutical laboratory. In collaboration with his fellow pharmacist, Joseph Caventou (1795-1877), Pelletier

*Lowitz was born at Goettingen and accompanied his father, the astronomer G. L. Lowitz on an expedition which ended with the murder of the latter. The then 18 year old youth remained in Russia. He died, however, at the University of his birthplace Goettingen.

isolated strychnine, brucine, quinine, cinchonine, and colchicine. In recognition of their discovery of quinine the Paris Institute of Science awarded Pelletier and Caventou a prize of 10,000 francs.

Another prominent French pharmacist, Charles Louis Derosne (1780-1846), worked extensively with the opium alkaloids. He isolated narcotine, for a time known as "Derosne's Salt." The former name was inappropriate as this alkaloid does not possess any narcotic properties.

Other alkaloids discovered by pharmacists were rapidly added to the growing list. Some of these were: emetine by Pelletier and Magendie, narceine by Pelletier and Dumas, hyoscamine, atropine, and delphinine by Brandes, caffeine (formerly classified as an alkaloid) by Runge, and independently by Robiquet, nicotine by Vauquelin, codeine by Robiquet, and coniine by Geiger.

Thus the armentarium of the physician and the development of the science of pharmacology were greatly enriched by the discovery of alkaloids which came from the laboratories of pharmacists.

Contributions to Analytical Chemistry

In connection with the discovery of fluorine and of aluminum reference has already been made to the German pharmacist-chemist, Andreas Sigismund Margraff (1709-1782). The chemical historian, Dr. Edgar F. Smith, referred to Margraff as "the regenerator of European chemistry." In 1758, Margraff showed that sodium and potassium could be differentiated by the yellow and purple color their salts impart to a flame. He proved that alumina, magnesia, and lime were distinct earths. His discovery of the presence of sugar in beets laid the foundation for the modern beet sugar industry. He used the microscope in chemical work, thus being one of the first chemical microscopists.

Margraff's successor as the dean of analytical chemists in Germany was his pupil, Martin Heinrich Klaproth. He also was listed in connection with the initial recognition of several elements, work which bears witness to his careful analytical technique. Nearly all of his work was carried out in the small laboratory of his pharmacy. His discovery of fluorine in bones and his separation of strontium from barium are among the many contributions included in his six volume book dealing with the chemistry of minerals.

In discussing analytical chemistry mention should be made again of Nicholas Vauquelin, the contemporary of Margraff and Klaproth who was considered the ablest analytical chemist of his day in France. Among his many discoveries in addition to chromium, beryllium, and nicotine were the isolation of asparagine, camphoric acid, quinic acid, and lecithin.

The first director of the world famous laboratory for analytical chemistry at Wiesbaden was the German, Karl Remigius Fresenius (1818-1897). In 1840, Fresenius studied pharmacy at Bonn University for one year and then went to Geissen as assistant to Liebig. In 1848 the Wiesbaden laboratory was established and here more analytical chemists were trained during the nineteenth century than in any other laboratory in the world. Fresenius founded the *Zeitschrift für analytische Chemie*, in 1841, which was still directed by the Fresenius family in 1939. The Fresenius texts on quantitative and qualitative analysis were regarded as the best books in their respective fields for over half a century.

In connection with quantitative methods the name of Herman von Fehling (1812-1885), a German pharmacist-chemist is noteworthy for his introduction of alkaline copper sulfate and alkali tartrates for the estimation of sugar and starch. This mixture, the well-known "Fehling's Solution" is still widely used.

Chemical Apparatus

Since many of the early pharmacy laboratories were the soil in which experimental chemistry flourished it is to be expected that they would make contributions in the form of laboratory tools. This expectation has been abundantly fulfilled.

Nicholas le Fevre (1610-1674), a French apothecary and for a time "Apothecary in Ordinary and Chemical Distiller to the King of France" is credited with introducing the thermometer as a tool into the chemical laboratory.

Antoine Baumé (1728-1804), a prominent apothecary-chemist of the eighteenth century is well-known for his invention of the hydrometer for measuring the density of liquids. Baumé was an apprentice in the famous Geoffroy pharmacy in Paris and later operated on an extensive scale a laboratory for the manufacture of chemicals and galenicals besides being the owner of a retail pharmacy. He was the author of several papers and books dealing with pharmaceutical chemistry.

At the age of fifteen Jean Baptiste Dumas (1800-1884) was apprenticed to a pharmacist in Alais, France. After a year here he obtained similar work in Geneva, Switzerland, where he became actively engaged in physiological chemistry. In his later years he was one of the noted chemists and statesmen of Paris. Dumas' method and bulb for the determination of the vapor density of volatile liquids is still a standard method for determining molecular weights. His name is also associated with one of the techniques frequently used for the determination of nitrogen in organic compounds.

Perhaps the pharmacist whose laboratory tools are best known is Carl Friedrich Mohr (1806-1879). The "Mohr" burette, the "Mohr" pinch clamp, and the "Mohr" specific gravity balance are tributes to his inventive ingenuity.

Ernst Beckman (1853-1923), like many others who became prominent chemists, began the study of science by working as a pharmacist. For over thirty years he taught chemistry at the University of Leipzig. The Beckman thermometer and the apparatus for the determination of molecular weights by freezing and boiling point determinations, which Beckman devised, are still widely used tools in physical chemistry laboratories.

The increasingly popular technique of micro-chemical methods has been enriched by the contemporary Austrian pharmacists Richard Wasicky (1884-) and his pupil Ludwig Kofler (1891-). The former devised an apparatus for the continuous extraction of minute amounts of solids, and the latter invented a micro-boiling point apparatus of unique usefulness.

The Future

Let us not consider that pharmacy's contributions to chemistry are closed. Is there not the possibility that pharmacy may recapture some of the lustre and prestige which it had so conspicuously earned and so widely enjoyed a century ago? At the du Pont exhibit during the recent World's Fair in New York some 18,000 visitors were asked the question, "What do you believe is the most important future development chemistry can make for the welfare of mankind?" The largest number of answers expressing similar sentiments, about twenty-five per cent of the entire group, stated as their hope that chemistry would develop disease controlling drugs.

Today in our research laboratories discoveries are largely the product of the cooperative efforts of groups of scientific workers rather than the isolated efforts of single individuals. Today also the major task of our colleges of pharmacy is to train men and women to enter the ranks of professional pharmacy. Notwithstanding these facts should we not be alert to the opportunity we have to send to graduate schools, students with a thorough background in pharmacy who will later qualify to enter our pharmaceutical research institutions from which will come these disease checking medicines and drugs?

Summary

In this article an attempt has been made to point out:

- (1) That the development of the science of chemistry has been greatly influenced and augmented by the contributions and discoveries of practicing pharmacists and by others whose early training was in pharmacy.
- (2) That teachers of chemistry in colleges of pharmacy have a fruitful opportunity to develop interest, enthusiasm, and respect for the study of pharmacy by appropriately calling attention to the contributions which pharmacy has made to chemistry.
- (3) That all too frequently chemical historians have failed to mention the influence of pharmacy in connection with the life and work of eminent chemists.
- (4) That students graduating from our Colleges of Pharmacy today, in addition to having open to them the profession of pharmacy as such, have also received a fundamental scientific foundation equipping them to enter graduate schools where they may obtain training to pursue research work where a background of pharmaceutical knowledge will be an especially valuable asset and pharmacy may recapture some of the well-earned prestige it enjoyed a century ago.

REFERENCES

- LaWall, Charles H., "Four Thousand Years of Pharmacy," J. B. Lippincott Co. Philadelphia, Pa. (1927).
Kremers and Urdang., "History of Pharmacy," J. B. Lippincott Co. (1940).
Moore, F. J. & Hall, W. T., "History of Chemistry," McGraw-Hill Book Co. (1930).
Venable, F. J., "History of Chemistry," D. C. Heath Co. (1894).
Weeks, Mary Elvira, "Discovery of the Elements," 4th. edition published by The Journal of Chemical Education (1939).

- Findlay, Alexander, "A Hundred Years of Chemistry," The Macmillan Co. (1937).
- Dampier-Whetham, "A History of Science," The Macmillan Co. (1930).
- Sadtler, Samuel P., "Influence of Pharmacists on the Development and Advance of Modern Chemistry," *Amer. Journ. Pharm.* 93: 198 (1921).
- "Scheele, The Pharmacist-Chemist," *The Laboratory*, Vol. XII, No. 1 (1940) published by The Fisher Scientific Co. Pittsburgh, Pa.
- "Burettes, How They Are Made," *ibid.* Vol. XII, No. 4, (1941).
- "America's Hopes for Chemistry," *News Edition*, page 737 August 25, 1940, published by the American Chemical Society.
- Fletcher, Jr. H. W., "The History of Nicotine," *J. Chem. Educ.*, 18, 303 (1941).
- Alyea, Hubert. N., "The Function of General Chemistry," *ibid.* 18, 309 (1941).

Cinchona and the Count of Chinchon*

GEORGIANNA SIMMONS GITTINGER
School of Pharmacy, University of Maryland

When the Indian, Segundo Jussieu tormented by thirst and fever, drank from a lake in which grew the roots of the quina plant, and was cured, quinine began its career.

Cinchona the bark from which quinine is derived, was originally an American plant. Carried to the East Indies in mid-nineteenth century it has become practically a monopoly there. Now world war has brought it home again.

The Indians called it quinquina bark, the early Spanish

*A very profound historical study of cinchona has recently been made by A. W. Haggis, curator of the Welcome Historical Medical Museum, London. The results of the study have been published in the *Bulletin of the History of Medicine* (10:417-459 and 566-592, 1941) under the title *The Fundamental Errors in the Early History of Cinchona*. This author came to conclusions which do not completely agree with the sources used by Miss Gittinger. Haggis is of the opinion that neither the Count nor Countess of Cinchon could have used and therefore could not have been cured by the use of cinchona bark. Quoting from the diary of Don Antonio Suardo, also cited by Miss Gittinger, Haggis believes it inconceivable "that in a diary of this character, * * * there should pass unnoticed * * * the discovery of an effective remedy against a disease that was defying all the skill of the medical profession and was rife throughout the world." As to the introduction of the drug into Europe, Haggis states that Juan de Vega and Michael Belga "could not have done so." (Note by Dr. George Urdang at the request of the Editor.)

name was cascarilla or Peruvian bark, and later Jesuit's bark. The name cinchona is supposedly in honor of the Countess of Chinchon, wife of a Viceroy of Peru. Linné in his *Genera Plantarum* of 1742 spelled it "cinchona" and in 1767 he favored "cinchona." His information was derived from two Frenchmen who explored Peru in 1735. Spanish botanical expeditions to Ecuador and northern Peru in 1778, 1783 and 1808 naturally wrote it correctly "chinchon." Authorities have been divided on its spelling but custom and reverence for Linné are very strong.

Given to the Spanish by friendly Indians its first notable European beneficiary was Don Juan Lopez Canizares, Corregidor of Loja in Ecuador, whose malaria was cured by it in 1630. He sent it to the Viceroy in Lima, and its transport to Europe is due to Dr. Juan de la Vega at Sevilla, Michael Belga in Flanders and to the Jesuits.

The knowledge of the curative virtues of quinine is historically contemporary with the term of office of the Viceroy, Count of Chinchon, who governed in the first half of the seventeenth century. This discovery is the most notable or at least the best known of his administration. However Pedro de Peralta y Barnuevo who wrote a metrical history "*Lima Fundada*" in 1732, in which he devoted nine stanzas to the Count of Chinchon, made no mention of the malaria. The fact is enveloped in legend skilfully recorded by Don Ricardo Palma in the traditional story "*The Powders of the Countess.*" But history informs us that it was not the Countess, Dona Francisca Enriquez de Rivera, second wife of the Count, but himself, Don Luis Geronimo de Cabrera y Bobadilla, IV Conde de Chinchon who suffered the distresses of malaria. His several severe attacks of the "tertianas" and continuous relapses are minutely detailed in the "*Diario de Lima*" of his secretary Juan Antonio Suardo.

As Viceroy Chinchon was an initiator of social hygiene. He ordered the first measures of quarantine in March 1630, attacked alcoholism, prohibited excessive consumption of coca, frequently visited the hospitals of the capital, and ordered constructed strong embankments over the Rimac River which flows through the town, to prevent the danger and damage of floods. Another great public work which makes the name of the Count of Chinchon famous was his founding of the first professorship of medicine in the University of San Marcos in 1635.

Since his Viceroyalty included all of South America except Brazil, he was concerned with the activities of robber bands of Indians at Titicaca. Don Rodrigo de Castro, his cousin was Governor there, and after a two year struggle the difficulty was settled by the Viceroy ordering that the Indians be paid for their work, instead of commandeering their services. In 1637 he fostered explorations of the Amazon from Quito to Pará; and on the second trip 1638-9 he sent Cristoval de Acuna as an observer to write botanical reports on all new and possibly useful plants.

Each Viceroy of Peru was required to keep a record of procedures and events during his incumbency. These records known as the "Diario de Lima" of the respective terms are stored in the Archives of the Indies in Sevilla. Some of them, notably that of Suardo depart from a monotonous chronology to give a vivid picture of the personalities and occurrences of the times.

The character of the Count is delineated as able, benevolent and just. He came to Peru at the age of 42, after the death of his first wife Dona Ana de Osorio, and six months after his second marriage.

This second wife Dona Francisca Enriquez de Rivera is one of the valiant women of her time. She was pregnant when they embarked at Cadiz, but this could not deter her from the Atlantic crossing, which must have been fearful in the small and fragile boats of the period. Traversing the Isthmus from Nombre de Dios to Panama City was equally full of discomfort, which was not diminished in the Armada of the South to Callao. This voyage consumed two long months struggling against wind and torrid equatorial heat. These difficulties finally forced the Countess to disembark at Paita and pursue the rest of her journey to Lima by land. At Lambayeque in January 1629 she gave birth to her only son Francisco-Fausto. As soon as she recovered she continued her way on horseback, arriving in Lima April 19, 1629. The Count had preceded her making his official entry January 14, 1629.

Her sojourn in the City of the Viceroys was spent between the care of her husband weakened by illness, her charities and the usual devotions of a profoundly religious woman. This is simply described in the Diary of the secretary Suardo. Eight years of nursing and anxiety must have been a serious drain

on her vitality. At the end of the term of the Viceroy in 1641, as they journeyed towards Spain she became ill, they were forced to stop at Cartegana of the Indies where she died.

It is interesting to recall that for centuries the wife of the Count of Chinchon who came to Lima was supposed to be the first one Dona Ana de Osorio. It was not till the nineteenth century when investigations of the Peruvian historian F. C. Coronel Zagarra appeared in "*Revista Peruana*" in 1879, and disclosed the true story that Dona Francisca Enriquez de Rivera was the celebrated Vicereine immortalized by an illness which she never suffered.

Medical science in Lima in the first third of the seventeenth century was replete with latin phrases and a collection of clysters, bleedings and purgings. The City of the Kings with its population of 25,000, its towers vibrant with ringing bells, its convents and arcades, and the surrounding belt of orchards and market gardens had a maleficent feature in the Rimac River. Torrential and dangerous in the spring until controlled by the embankment built by the Count of Chinchon, it also fostered malarial mosquitoes, and the Count was among their victims.

Suado gives us a clinical history of the Count's tertian malaria. His first severe attack came in June 1631, when all the church bells of Lima tolled mournful prayers for the restoration of the Viceroy threatened by death. His court physician Dr. Juan de la Vega, with frequent medical consultations, subjected him to violent bleedings and the inevitable purgings to permit the escape of "corrupt humors." We review with Suado, the faithful and conscientious secretary, all the minutae of the relapses and complications of seven consecutive years. But relief came. Fortunately he responded to applications of the bark sent by the Governor of Loja, which the Countess insisted on giving him. His fever abated and he suffered no more relapses after 1639.

Don Luis Geronimo de Cabrera y Bobadilla, IV Conde de Chinchon returned to Spain in 1641 and retired to his ancestral estates at Chinchon about twenty miles from Madrid. There he lived with his son until his death in 1647.

The family of Cabrera y Bobadilla, Counts of Chinchon, died out with the eighth Countess, cousin and heir of the seventh Count, and the title reverted to the Crown in 1764. In this connection there is a sad commentary on the glory of a

name. The title was sold by Charles III to his brother who eventually gave it to Godoy.

References

- Las Tercianas del Conde de Chinchon—Carlos Enrique Pas Soldan, Lima, 1938.
The Countess of Chinchon—Clements R. Markham, London 1874.
La Revista Medica, Book Reviews, Lima, 1939.
Historical Notes on Quinine—Durval Torres, *Gazeta Pharmaceutica* (Rio de Janeiro) 8 (1939), 19.

Should the History of Pharmacy be Taught in The First Year of the Curriculum?*

CYRUS L. COX

College of Pharmacy, Rutgers University

The history of pharmacy is interesting to and profitable for students of pharmacy. The question is raised as to where this course should appear in the curriculum. Some feel that it should be offered during the last or the next to the last year, or in other words, after the student has become familiar with most of the galenical and chemical pharmaceuticals. I, however, feel that a student who is entering the study of a profession should be introduced immediately to the background of that profession. The method of presentation which follows will serve as an introduction.

It is quite reasonable to suppose that man attempted to alleviate pain long before he gave consideration to any of the other arts. These attempts led to the accumulation, preparation, preservation, and classification of drugs. Thus began the practice of pharmacy from which branched the practice of medicine. Astrology, resulting from the superstitious connection between celestial bodies and physical discomforts, gave rise to astronomy, and chemistry is an outgrowth of alchemy. Thus, we can proudly claim that pharmacy is the mother of all science.

After speculating on the prehistoric aspects of pharmacy, ancient and medieval pharmacy can be considered. Pharmacy of the new world is a development of pharmacy of the old world. Our Pharmacopoeia was patterned after the pharma-

*Read before the Conference of Teachers of Pharmacy at the 1941, Detroit meeting.

copoeias of Europe, and our National Formulary serves the same purpose as do the compendia and extra pharmacopoeias of the continentals.

Colleges of pharmacy originally were gatherings of individuals who sought protection for their profession and who were interested in extending the limits of their professional knowledge. Here was the precursor of our modern colleges and schools of pharmacy and of our state and national associations. Attempts to improve and to standardize the training offered by educational institutions gave rise to the American Conference of Pharmaceutical Faculties which later became the American Association of Colleges of Pharmacy. To protect the interests of the public, the privilege of granting license to practice pharmacy was delegated to local state boards of pharmacy, which were eventually organized under the name of the National Association of Boards of Pharmacy. The American Pharmaceutical Association owes its existence to the recognition of the necessity of a national representation of American pharmacy by the five colleges existing at that time and the representatives of three other local groups of pharmacists. The founding of state associations, the first of which appeared in 1867, i.e., fifteen years after the founding of the A.Ph.A., was very much welcomed if not even initiated by the A.Ph.A., in order to effect legislation favorable to the aims of professional pharmacy in the individual states.

Such a presentation of the background of this oldest of arts will inspire the freshman student with a deeper respect for his chosen calling. He will show a greater interest in the subjects which follow through the other years of his studies.

The Education of an Educator

PAUL J. JANNKE

College of Pharmacy, University of Nebraska

The average university student frequently thinks about his instructors. "*What are their individual backgrounds?*" and "*What qualifies them to teach the subject they offer?*" are questions which possibly remain unanswered in most students' minds. In the larger colleges of a given university, the students never do learn the answers, but in the smaller colleges the information may be divulged through prolonged contact with the same instructors. Colleges of pharmacy are

outstanding in this respect because the enrollment is relatively low, and a wholesome, intimate relationship is established between instructors and students without sacrificing discipline. Yet, relatively few pharmacy students are familiar with the backgrounds and the qualifications of their instructors.

The American champion of pharmaceutical education recently passed from our midst. Because he was not the recipient of world-widely advertised laurels, the full effect of the forceful influence which Edward Kremers had on pharmaceutical education will be felt only after many years have passed. Edward Kremers was too busy to think about honors. He was neither a politician nor a promoter. His life was devoted to the raising of the standards of pharmaceutical education so that the pharmacist would be classified in the professional group of men and removed from the category of tradesmen. Was he qualified to do this? Did he succeed in his attempt? The answer to both questions is a vehement "yes."

The story of the life of Edward Kremers is very lengthy and most interesting. The writer possesses many chapters from the autobiography of Dr. Kremers, and the sketch of the education of the immortal pharmacist is abstracted from these chapters. A sketch is all that this paper can be. True, the translation of Gildemeister and Hoffman's "*Die aetherischen Oele*," and the editorship of the *Pharmazeutisches Rundschau*, the Pharmaceutical Review, the Pharmaceutical Archives, the History of Pharmacy, the National Dispensatory, etc., contributed immensely to the man's education, but these achievements are incidental to his formal education. After all, everything one does teaches him something.

It is stated in his inaugural dissertation that primary training was received in the public schools of Milwaukee. He was permitted to enter, in 1879, the so-called college department of the Mission House which was primarily a theological school of the German Reformed Church, in Sheboygan, Wisconsin. His first chemistry teacher was Professor Kurtz, an Austrian Catholic missionary who also offered training in music, mathematics, and physics. Dr. Kremers was an accomplished organist, and though there is no written record of it, it is assumed that this training was received from Professor Kurtz.

His interest in the natural sciences and his determina-

tion to be financially independent of his ill father caused Edward to leave the Mission House and to sacrifice further training in Latin and Greek. Extra-curricular reading of Gustav Freytag's "*Soll und Haben*" imbued the youth with the romance of the drug trade, and therefore, he was eager to accept an apprenticeship in the "*Apotheke*" of Louis Lotz, in Milwaukee. German-born Mr. Lotz studied at the University of Munich where the faculty consisted of: Liebig (chemist), Pettenkofer (master pharmacist and hygienist), Kobell (mineralogist), Jolly (physicist, after whom the specific gravity balance is named), Buchner (pharmacist), and Siebold (zoologist). This faculty served as an inspiration to Kremers, a young man interested in the natural sciences. His actual experiences with Mr. Lotz are best expressed in his own words. "After the day's work had been done, we were expected to study and to write up our notes. At times, Mr. Lotz would bring a bottle of wine, and while sipping over a glass of *Rhenish* he would tell about his trips to the sea (Helgoland) or to the Alps. Alternate Sundays, I was on duty with him. During quiet afternoons, he would work over his collections. To act as his understudy was to receive a liberal education. Moreover, everything he undertook was not only *lege artis*, pharmaceutically speaking, but artistically done as well. My apprenticeship was to have lasted three years. During my first year I received no compensation. During the two remaining years, I was to receive the munificent remuneration of five dollars per month. After the end of the first month of the second year, Mr. Lotz handed me a gold, ten dollar coin. Thereafter, it was always an eagle, not a check or a green back. With these riches, I went to a near by antiquarian and there deposited one-half of my earnings for a copy of Kopp's '*Beitrage zur Geschichte der Chemie*.' The day's work being concluded at 10 o'clock in the evening, I would depart for home and study this volume until midnight, applying my smattering of Latin and less than a smattering of Greek in trying to decipher Kopp's quotations from ancient and mediaeval authors."

Having worked a year for nothing and a second year for one hundred and twenty dollars, Mr. Lotz released him after two years instead of the conventional three. He left for the East in the fall of 1884 to attend the Philadelphia College of Pharmacy. Here, Maisch was Dean and Professor of Botany

and *Materia Medica*, Remmington was Professor of Pharmacy, and Sadtler was Professor of Chemistry. Sadtler, who was a graduate of the University of Goettingen, had as laboratory assistant Professor Trimble who later acquired a reputation as an investigator of tannins. In 1885, Edward enrolled in the University of Wisconsin for his senior year because of the limited amount of time devoted to laboratory work at Philadelphia, unless he were willing to pay an extra monthly fee. At Madison, he had the opportunity to work in the laboratory all day for a nominal fee.

At Wisconsin, Professor Daniells taught quantitative analysis. Daniells, a graduate of Michigan Agricultural College was the first head of the chemistry department. Dr. H. W. Hillger, one of Remsen's students from Johns Hopkins, taught elementary organic chemistry. It was at this time that Edward met Dr. Frederick B. Power, a graduate of P.C.P., and there began an intimate friendship which lasted throughout the remainder of the life of Dr. Power. One can easily spend a day reading Dr. Kremers' personal correspondence with Dr. Power. Mutual admiration is most evident in these letters. To the last year of his life, Dr. Kremers regarded Frederick B. Power as the greatest of his many illustrious masters. The reason is obvious. Though Power was a Professor of Pharmacy and *Materia Medica*, he had earned a widespread reputation as a plant chemist. He introduced Kremers to the fascinating field of phytochemistry, a field in which the younger man was destined to become a world-wide authority. After graduation from the Pharmacy Course in 1886, Edward served as laboratory and quiz class assistant to Dr. Power, and he did his first bit of research by way of a bachelor's thesis on *Fraxinus americana*. Two additional research problems on the volatile oils of pennyroyal and citronella won for the young investigator the Ebert Prize of the A.Ph.A. At this point, it is interesting to note that Dr. Hillger discouraged Kremers from doing research in organic chemistry. He, Hillger, quoted Remsen as having said that for ten years the chemistry graduate should repeat the work of others. Dr. Power did not agree with this, and thereafter his understudy devoted all of his spare time to research in the pharmacy laboratory. Having completed the year as an assistant, the young pharmacist reregistered in the University and received the bachelor's degree with th class of '88.

In order to please his mother, Edward Kremers accepted an apprenticeship in the office of Dr. Senn, the noted surgeon. His heart was not in his work, however, and when his father offered to send him to Germany to study, Edward was not slow in accepting. In September, 1888, he departed for the Chemical Institute at Bonn to study under Dr. Otto Wallach whose epoch-making researches published under the general title, "*Terpene und Kampfer*," he had read while investigating the oils of pennyroyal and citronella. There he attended Kekule's daily lectures on organic and inorganic chemistry, during alternate semesters. Kremers' reaction to Kekule's lectures are cast in this quotation: "These were an inspiration, for I had never heard anything like them on any subject. I took but few notes. However, every evening was spent in going over the subject with the aid of the *Lehrbuch der Chemie* by Richter, a former student of Kekule. The set of Richter, which I still have, was bought with the money of the Ebert prize."

Three days each week, Edward went to the Poppelsdorfer Schloss to attend Strassburger's lectures on botany. The rest of the days he spent in the laboratory working under Wallach. During the second semester, he served as second assistant to Wallach, and it was during this time that he regenerated pinene from its nitrosochloride.

When Wallach was called to Goettingen, Kremers was one of the twelve students who went with him. Here, while working in the laboratory built by Victor Meyer, he made the acquaintance of Mahlman, a glass blower, who made the first glass condenser for Liebig during the latter's visit with Woehler, in Goettingen. The only lectures which Edward attended while here were those of Nernst who had just come from Ostwald's Institute in Leipzig to introduce physical chemistry at Goettingen. One afternoon of the week was spent in Liebisch's laboratory in the Mineralogical Institute, and Saturday afternoons were spent in Rieke's laboratory of the Physical Institute. During the summer semester, he took part in the geological excursions of von Koenen just as he had botanized with Schimper at Bonn. Most of his time however, was devoted to work on his dissertation. Because of his skill in preparing crystalline derivatives from limonene, (30 or more) he was called "*Krystallfischer*" by his colleagues. The concluding statements about his formal education was

taken directly from Dr. Kremers' autobiographical notes. "It would be wrong to leave the impression that all of my chemical education was acquired in lecture room, laboratory, and library. Personal contact with mature students from all parts of Germany meant much. (In this connection, it may be well to repeat the statement which Dr. Louis Kahlenberg made in a personal communication. It reads "Ed Kremers studied under the most brilliant men that Europe has ever seen.") The chemical museum at Goettingen contained a specimen of aluminum, as large as a pea, first prepared by Deville in Woehler's laboratory. My last day in Goettingen was memorable, for it enabled me to attend the unveiling of the monument to Woehler and to listen to the inimitable chemical biographer, August von Hofmann. Tollens, the agricultural chemist, also spoke. In Leipzig I visited the laboratory and saw the models of Wisliscenus which the designer studied by the hour, trying to unravel stereochemical problems. In Ostwald's laboratory, I met Beckmann of thermometer fame. In this connection, I should not forget to mention my visit to the laboratories of Schimmel and Co., where I made the acquaintance of Dr. Gildemeister, an acquaintance which ripened into a friendship lasting until his death, a year or so ago."

Earlier, Dr. Kremers was referred to as the American champion of pharmaceutical education. His life was devoted to raising the standards of this type of education. How he accomplished this has been told only in part on many occasions. The complete picture is a revelation. After returning from Europe to the University of Wisconsin, in 1890, he accepted an instructorship with Professor Power. When Power was called to London, in 1892, to assume directorship of the laboratories of Burroughs Wellcome Co., Ltd., Dr. Kremers became Director of the Course in Pharmacy and Professor of Pharmaceutical Chemistry. Both academic training and research prospered under his directorship. Requirements for entrance to the Course in Pharmacy were made to include high school graduation. Before long, the two year Course in Pharmacy was increased to three years, and next, university graduation was a prerequisite of the State Board Examinations. Then began a long hard fight. Dr. Kremers always demanded that pharmacy students be recognized on a par with other students on the campus. This

could be guaranteed only by having pharmacy courses which were equal to or superior to other courses in the University. That is how the four year course was conceived and born. Deluged by protests from his colleagues (they feared a drastic drop in enrollment, because few enough students could afford the three year course) in pharmacy circles, Dr. Kremers fought for his ideal, and in 1932, the four year course became mandatory; the same year, it was adopted throughout the nation as the standard of pharmaceutical education. It is splendid that Dr. Kremers lived long enough to see his ideals carried further. The faculty at the School of Pharmacy of the University of Wisconsin has been planning for some time the introduction of a five year course; all of this to raise the standards of the profession.

Many years ago, Wisconsin's graduate work in pharmacy reached a level unsurpassed to date by any school in the country. Advanced students came from all parts of the world to conduct their research under the guidance of Dr. Kremers, who had acquired a wide reputation as an authority on plant chemistry and on the chemistry of the volatile oils. Professor Karl Paul Link once stated: "The most remarkable thing about Kremers is the fact that he does not have to offer fellowships and assistantships to get students to work under him." The first person to receive the Doctor of Philosophy degree from a school of pharmacy in this country was one of Dr. Kremers' first assistants, Oswald Shreiner, who is at present Chief of the Bureau of Plant Industry, U. S. Department of Agriculture. This was shortly after the turn of the century. In the fruitful years which followed, Dr. Kremers built up a brilliant record. Hardly a year passed without one or more of his students fulfilling the requirements for the highest degree. Even after his official retirement from the Wisconsin faculty, he served in the capacity of a director of research, working with unrelenting effort, and having the pleasure of seeing eight more of his students finish the work for their doctorates. The total number of people who received their Ph.D. degrees for work done under Dr. Kremers is a staggering 57. No other man in pharmacy has even approached this record; indeed, few men in other fields have surpassed it. Most of Dr. Kremers' graduate students are at present teaching in pharmacy schools. They can be found in many of these United States, Europe,

Syria, Puerto Rico, Philippines, and China. Some are engaged in research in the laboratories of pharmaceutical manufacturing concerns, while a few are doing similar work in other industries, and a few are in the Governmental laboratories devoted to plant science.

As Dr. Robert Swain recently wrote, "Someone once remarked that only the most truly great merit so much as a footnote reference upon the pages of recorded history. While Dr. Kremers was looked up to as a great leader in pharmaceutical education, now that he has passed on we know that the professional education in our field has lost its supreme figure. The time will never come when the progress in pharmaceutical education can be understood without an understanding of the basic educational philosophy which was so much a part of this truly superb man."

A Course in Theoretical and Practical Pharmacy For the First Year Student in Pharmacy*

LEON A. THOMPSON

Massachusetts College of Pharmacy

The educational requirements of pharmacy of today may be considerably different in many points from those of yesterday, or several decades ago, but the fundamental principles remain as unaltered as the physical laws upon which they are based. If the background of the material necessary for the needs of the student is so thin as to be of little value, the result is a handicapped person serving the public under the guise of an educated pharmacist, usually with an exalted opinion of his own qualifications.

The construction of an ideal course in pharmacy would not be a difficult problem if we could present it to an ideal class of students, but, with the problems of individual opinions of teachers and individual differences in students, any outline presented will be subject to some adverse criticism. A course constructed upon the principle of the "greatest good for the greatest number" should meet with the approval of the majority.

*Read before the Conference of Teachers of Pharmacy at the 1941, Detroit meeting.

It is logical that the best presentation for me to give is the one I have used and have found to work out in practice as well as in theory. This has been constructed over a period of years, covering the developments made necessary by changes in educational requirements and in actual practice.

The objectives of this course are, specifically, to orient the student in pharmacy; to bring about the required familiarity with the physical principles and processes employed in pharmacy; to emphasize the basic techniques of these processes rather than the nature of the resulting product of its classification. The lecture form which I follow includes references, definitions, objectives, divisions of subject and elaboration of specific information. I shall offer a short statement relative to each lecture as given.

Lecture 1. The orientation of the student begins with a brief outline of pharmaceutical history together with an introduction to the principles of pharmaceutical ethics. A careful review of the official literature and reference material is given, and the value of affiliation with active pharmaceutical organizations and their current activities is impressed upon the beginner. He probably is not able or qualified to become immediately active in these, but early impressions and continued references may be of value to him.

Lecture 2. The subject of metrology is one of the most important phases of the early instruction of the student, and each exercise covering the various processes is supplemented with the mathematical calculations involved. In the laboratory assignments, the metric and other systems are employed, conversions required and sufficient work given for a basic understanding of the advanced material to be presented in the other departments. A student or a pharmacist with improper training and ability in this subject is again handicapped and often is a menace to the public. It is our duty, therefore, to devote a satisfactory number of hours to develop it.

Lecture 3. The processes of weighing and measuring are among those which contribute to the specialized training of the student, and laboratory work with balances, weights and measures is a basic adjunct to the proper development of expert ability.

Lecture 4. The next topic taken up is the subject of specific gravity, reviewing the principles and preliminary methods involved. This is coördinated with the material incident to chemistry which stresses the work upon solids and gases. The laboratory work in pharmacy is concerned chiefly with liquids.

Lecture 5. Lecture work is continued upon specific gravity, developing the processes using the various hydrometers and balances that may be of value to the pharmacist, and the laboratory work is based upon this viewpoint. There would be little practical value in having a pharmacy student obtain the specific gravity of rubber cement, road tar, or cup grease, other than to familiarize him with the principles of the processes. However, these may be very satisfactorily learned

by working with pharmaceuticals and the special purpose instruments covering his field.

Lecture 6. The presentation of this lecture, which concerns heat, its generation, regulation, and measurement, should be closely coordinated with instruction in chemical processes in the department of chemistry. Unless this coordination is obtained, much repetition of a primary nature may lessen the value of the spoken word. Particular emphasis should be placed upon thermometry. Conversion formulas are given in the pharmaceutical mathematics course as well as in the laboratory work which also requires the estimation of boiling points, melting points and processes involving pharmaceutical baths.

Lecture 7. Those processes involving the application of heat are here extended, particularly in connection with the changes in state of matter where the physical phenomena are observed. The work in the laboratory includes exsiccation, calcination, and vaporization in its many applications.

Lecture 8. The process of distillation is next introduced, beginning, after an historical introduction, with simple flask distillation and ascertaining the specific gravity of the distillate.

Lecture 9. Continuing with the subject of distillation, in many of its ramifications, specific experiments on sublimation are included. The factual presentation is supplemented with reference material.

Lecture 10. Comminution, with the preliminary processes for the preparation of material for this phase of pharmaceutical technique, is covered in the arrangement of lecture, text, and laboratory practice. The important manipulation of sieving is included with this subject.

Lecture 11. The processes embodied under filtration are taken up in an inverted sequence, referring to the usual arrangement of textbooks in which filtration follows the topic of solution. We base the reason for this change of presentation of subject matter and laboratory work upon the fact that early training in the production of clean pharmaceutical solutions is advisable. Constant repetition of laboratory work is required until the desired results are obtained.

Lecture 12. The lecture on solutions is based upon the conventional text book material and is outlined in its simplest form. Greater elaboration is impractical in the limited time at one's disposal. Many important pharmaceutical problems constantly arise necessitating frequent reference to this important process.

Lecture 13. The topics of solvents and simple types of solutions were given in the previous lecture and they are continued with elaboration upon the preparation of definite types of official formulas, and with an introduction to the subject of isotonic solutions. More specific work with the mathematical calculations of isotonic solutions follows in advanced course instruction.

Lecture 14. The last assignment on the subject of solution includes colloids and dialysis, and again we are obliged to limit our discussions to the most pertinent pharmaceutical applications, realizing that one specializing in colloidal chemistry can devote a lifetime to its study and usage in industry.

Lecture 15. The many processes supplementary to filtration, for the separation of solids from fluids, are taken up in the order of their im-

portance to the pharmacist, and laboratory exercises assist the student in practical application. The means for the separation of immiscible liquids are given attention.

Lecture 16. Precipitation and the correct technique of the processes and applications of precipitation to pharmaceutical problems furnish more than enough material for one period in the lecture room and one period in the laboratory. Again, we have a process which is elaborated upon throughout the entire time a pharmacy student devotes to his education. It is a basis for the analysis of many of his future dispensing problems, and if he does any extemporaneous manufacturing the technique is especially important.

Lecture 17. Crystallization, granulation and exsiccation are processes where the fundamentals must be known and manipulative work understood. These fundamentals are best acquired with the help of laboratory exercises in conjunction with text material.

Lecture 18. The subjects presented under the general topic, the extraction of vegetable drugs, include expression, maceration, and digestion. Practice in these operations is given.

Lecture 19. The art of percolation, which is fast becoming a lost art, is offered to the student with a brief historical introduction, and it is then outlined from the official texts. The laboratory periods are devoted to as many examples of all these processes as can be finished in the available time.

This completes the preliminary material covering this subject matter. It is followed by the interpretation of processes previously presented, in their relationship to galenicals and the making of pharmaceutical preparations. Following is a typical lecture outline covering the official classes of preparations. Also attached to this paper, are copies of two laboratory exercises outlining the work given in connection with aromatic waters. The student is required to return written answers to the questions asked upon the topics under consideration.

Outline of Lecture

- Class
- Definition
- References
- Method of preparation
 - General formula
 - Type processes
 - Theories involved
- Manner of dispensing
- Incompatibilities
- Storage and preservation
 - Evidence of deterioration
- Advantages of class
- Uses

The concluding lecture work of the second semester of

this first year is composed of prepared abstracts upon individual official classes of preparations of the simpler types, covering the U.S.P., N.F. and some unofficial waters; solutions, both simple and compound, infusions and decoctions, syrups, mucilages, and mixtures.

The nomenclature of pharmacy has been a perpetual theme throughout the year, and its correct use in both Latin and English titles is constantly dwelt upon to supplement the courses in these two subjects. The time allotted to the subjects reviewed is as follows:

- Pharmaceutical Latin, class, 1 hour
- Pharmaceutical Mathematics, class, 1½ hours
- Pharmacy, class, 2 hours
- Pharmacy, laboratory, 3 hours

The sequence of the employed time in pharmacy is a lecture period of fifty-five minutes, a laboratory period of three hours, a written quiz during fifteen minutes and a conference of forty minutes.

Laboratory Exercise No. 19

Waters

Prepare the following:

107. Spearmint Water, U.S.P., 125 cc., by the official type process b., completing the filtration next week.
108. Peppermint Water, U.S.P., 125 cc., by the official "alternative solution method", using either purified talc or purified siliceous earth as the diffusing agent.
109. Camphor Water, U.S.P., 125 cc.
110. Chloroform Water, U.S.P., 60 cc., using 1 cc. of chloroform, shaking it repeatedly with 100 cc. of distilled water, allowing it to stand until perfectly clear and then decanting 60 cc.
111. Phenolated Water, N. F., 60 cc.

Label Each Preparation With Its Full Latin Title

- a. Distinguish between Distilled Water, Sterilized Distilled Water, and Redistilled Water.
- b. What is meant by potable water?
- c. State the advantages and the disadvantages of the aromatic waters as vehicles.
- d. State the general methods by which medicated waters are prepared and give an official example of each.
- e. What are the properties of a good pharmaceutical diffusing agent?
- f. Why not use magnesium carbonate as a diffusing agent in preparing aromatic waters?
- g. How is Chloroform Water directed to be stored?

Laboratory Exercise No. 20
Waters continued

Prepare the following:

112. Cinnamon Water, U.S.P., 125 cc., by an extemporaneous method.

113. Bitter Almond Water, N.F., 125 cc.

114. Rx Magnesii Sulfatis dr. vi
Aquae Menthae Piperitae q.s. ad f oz. ii
Sig: f dr. iv p.r.n.
(Compound as written to demonstrate the incompatibility)

115. Rx Magnesii Sulfatis dr. vi
Aquae Menthae Piperitae q.s. ad f oz. ii
Sig. f dr. i si opus sit.
(Compound so as to overcome the incompatibility)

- a. What are empyreumatic odors?
- b. State the principal incompatibilities of medicated waters made from volatile oils.
- c. What is cohobation?
- d. Name three official waters made only by distillation.
- e. State two indications of deterioration of aromatic waters.
- f. In the directions for making distilled water, the first 100 volumes and the last 150 volumes are rejected. State the reasons for this procedure.
- g. Figure the cost of one gallon of Peppermint Water, exclusive of labor and container. Compare this with the manufacturer's price as posted on the bulletin board. The prices of the oil, talc and distilled water are similarly posted.

Discussion

Earl P. Guth, College of Pharmacy, Ohio State University.—Professor Thompson has indicated in his paper that the teaching of pharmacy to beginning students is subject to considerable variations. That the methods used and the scope of the material varies with different colleges is a well known fact. The reasons for these variations usually may be found by examining the conditions which exist at each school. It has been my privilege to have been connected with three different schools in widely separated areas. At each of these schools the subject of beginning pharmacy is taught, but each one is different from the others as concerns the actual material covered. On close examination of the courses, however, they are found to be fundamentally the same. At one school the course includes principles of pharmacy, pharmaceutical Latin, pharmaceutical arithmetic, and history of pharmacy. At another school, all above mentioned courses are taught as separate courses. At the third school, pharmaceutical arithmetic is taught as a separate course, while the other subjects are taught in the beginning course of pharmacy. On examination of the Syllabus under pharmaceutical technique and theory of pharmacy, we find that we can sum up the scope of this material with three words: *tools-technique-terminology*. If these three phases of pharmacy are adequately covered in lecture and illustrated by carefully selected laboratory exercises, a student is then ready for the more comprehensive considerations of pharmaceutical prepara-

tions. The planning of laboratory work and the reports of the laboratory exercises should be done with the utmost care. There are many different forms that can be used for laboratory reports, each one having its own salient points. It seems to me, however, that the laboratory report should be as simple and as much to the point as possible. Complicated reports nearly always defeat the real purpose of the laboratory exercise. Arithmetic should be incorporated in practically every exercise, not only in the beginning course, but also in all subsequent courses in pharmacy. I believe that all those who have taught pharmaceutical arithmetic will agree that the abstract nature of arithmetic is one of the chief causes of difficulty of this subject. If, however, the student actually sees the amounts to be used in weight and volume, he gets a very real picture of amounts and types of mathematical calculations. Certainly, arithmetic is one of the most important tools of pharmacy. The choice of preparation to be made for illustration of a certain technique is very important. The preparation should be simple and possess pharmaceutical appeal. Taking the specific gravity of rubber cement and road tar is out of the question. These substances are obnoxious as well as non-pharmaceutical. The Pharmacopoeia and National Formulary are full of substances that make ideal subjects for the study of specific gravity. Don't lose the point by giving the student something messy and difficult to handle! If a course in manufacturing pharmacy or galenical pharmacy is to be given subsequent to the beginning course, a well coordinated program should be worked out between the two courses. The basic techniques must be thoroughly learned if any real progress is to be made in the advanced course. In the beginning course, the emphasis must be placed on such things as cleanliness, weighing, measuring, pouring, filtering, comminution, calculations, labeling, and official titles. The finished product is incidental to these techniques. In the courses in manufacturing pharmacy and galenical pharmacy, emphasis is then placed on the finished product and on the reasons for certain procedures. Tools, technique, and terminology must be emphasized continually in freshmen courses in pharmacy.

James W. Jones, College of Pharmacy, State University of Iowa.—My remarks concerning the text of Professor Thompson's paper are not in the form of a criticism, because I feel that any plan which effectively acquaints the first year student with the essential, elementary, pharmaceutical facts within the area described is sound pedagogy. At the College of Pharmacy of the State University of Iowa, we present the material just discussed in three separate, yet closely allied year courses. The courses are catalogued as follows: Theoretical Pharmacy, three credits per semester, and Pharmaceutical Laboratory, three credits per semester, and Pharmaceutical Arithmetic, two credits per semester. We feel that this division of the work is justified since the collective scope includes the principles and fundamentals without which no student can properly progress through the more advanced courses contained in our curriculum. The three courses are closely associated in presentation so that the student is able to progressively adapt the facts learned in one to the processes involved in the others. The theoretical course consists of three lectures per week, and, during the first semester, deals with a brief history of phar-

macy, a discussion of pharmaceutical ethics, the importance of official and closely related non-official texts, reference books and journals, through which one keeps abreast of pharmaceutical progress. The individual and collective value of association work is also discussed. Next in order are the discussions of the various operations of physico-chemical nature used in pharmacy. These lectures are supplemented by demonstrations of various pieces and types of apparatus or machines used in each operation. The second semester is devoted to a brief discussion of the U.S.P. and N.F. preparations. These are considered in the light of their general class, methods for preparing, official names, including synonyms, requirements, dose, use, etc. Some time is devoted to pertinent facts concerning the components of each preparation. In pharmaceutical arithmetic, the student is acquainted with the weights and measures used in pharmacy and their relations to each other, specific gravity, percentage in all its aspects, alligation and other necessary mathematical requisites. The facts gained in the foregoing two courses are aptly applied in the pharmaceutical laboratory course which consists of six laboratory hours and one lecture hour per week. Here the student is required to make about 150 U.S.P. and N.F. preparations of all types which illustrate the various processes used in pharmacy. Here the student also begins his training in dispensing. The solid materials to be used in the various preparations by the class are weighed out in the amount to be used in each preparation and placed in a tray along with the regular stock of any liquids required. Each tray contains the materials for one preparation. Students are selected alphabetically from the class to dispense these materials to the class. To obtain materials, the student must present an itemized written requisition at the dispensing window to be received and filled by the dispenser. The materials are then taken to the student's desk where all compounding is done. The laboratory work is closely supervised by at least two members of the faculty at all times. This method of presenting the elementary yet fundamental pharmaceutical background to the first year student, as before stated, is not given as a criticism of other methods, but as one which we at Iowa find adaptive and very effective in producing desirable results.

C. O. Lee, College of Pharmacy, Purdue University.—It may be true that some of the four year curricula are not much more than the two-year ones made thin to satisfy an increased time requirement. If such is the case the spirit of the minimum four-year course has been violated. In adopting the minimum four-year curriculum it is expected that more time should be given to instruction in not only professional subjects, but in cultural subjects as well.

An improved curriculum should aid in making better pharmacists. It is to be hoped that many of them will become helpfully critical of their profession and be stimulated to work hard for improved standards in pharmacy. An ideal curriculum is not possible because of many diverse views as to the content of courses in pharmacy. Even so, we may well agree upon what has been referred to as fundamental principles.

The objectives set forth for a beginning course in pharmacy are fair. Some of us have had such objectives to guide us in this course for a number of years. It is observed that pharmaceutical history, ethics, literature, and organizations are covered in one lecture. It is

to be regretted that our schools have not seen fit to devote several lectures to each of these important subjects. Our students should be more thoroughly oriented with respect to them early in their college experience. I am very sure that we fall down at this point in our curriculum building. The remaining lectures for the first semester follow the orthodox pattern to which many of us hold. In so doing, we should all be able to acquaint the students with what has been referred to as the fundamental principles involved in pharmaceutical practice. From the educational viewpoint the plan of presenting subject matter by the combined lecture-laboratory method is ideal. The exercises required of the student in such a course certainly involve the use of fundamental techniques upon which professional skills are based. The theoretical discussions of this course bear very directly upon its practical aspects.

This review so far has dealt almost entirely with course content. May we now ask, "What of the student? Has he learned things and acquired skills?" Perhaps he has, but what is his attitude toward the course and toward pharmacy? Would he advise other folks to take the course? Has he had an experience that makes him confident that he has chosen the right profession? Some may ask, "What has attitude to do with the acquisition of knowledge?" I wish to reply by saying that unless I as a teacher am able to strike fire with the young men who enter my classes, pharmacy as a profession suffers. Objectives for courses are good, and we need to give much attention to course content and methods of presenting the subject matter. Would that we could know more about the attitude and mind of the student after his first year in the school of pharmacy or perhaps even before he presents himself as a student!

The Usefulness of Manufacturer Publications*

CHARLES O. WILSON

College of Pharmacy, University of Minnesota

It has been justly said that pharmacy is becoming more and more a profession of information and service rather than a profession of art. Today the successful practicing pharmacist must have at his command not only a knowledge of official drugs and preparations but also a fund of accurate facts about the so-called specialty products. The information that the present-day pharmacist should be able to supply is enormous, and to help him in this task there are available many free publications that he should receive and read.

Some time ago some one stated that the person who provides the stimulus for professional reading to pharmacists

*Read before the Conference of Teachers of Pharmacy at the 1941 meeting at Detroit.

will be doing the profession its greatest service. The fact that pharmacists do not read scientific literature is evidenced by the small membership of the American Pharmaceutical Association and other pharmaceutical organizations dedicated to scientific advancement. It is often argued that the pharmacist can not afford to invest in professional books and journals, but this is no excuse for failing to take advantage of the free literature offered.

The general feeling among many people is that the pharmacists are not a "reading" class. Pharmaceutical manufacturers feel that their money is better spent in supplying information to physicians and dentists where it will be read and used than by sending it to pharmacists. Some companies do practically all their promotion work through the physician and the pharmacist must learn about it in any chance way that he can. In many cases pertinent literature will not be mailed to anyone outside the medical profession. How can pharmacy be of service to medicine if such policies are continued? The fault can not be and is not here, placed upon the publishers of these house organs, as they must mail their limited supplies to the places where they will do the most good and truly, many pharmacists would not read them.

A lack of reading interest by pharmacists was pointed out in 1940 by Kirsch (1) who showed that of 338 new books published in the medical, dental, and pharmaceutical fields in 1937, not more than 10 could be classified as being entirely in pharmacy. When one considers the ratio of books published in the various fields to the number of members in each, it is immediately apparent that the number of books published for the pharmacists falls far below the ratio of those published for the medical and dental groups.

A pharmacist's "library" usually contains the United States Pharmacopoeia, the National Formulary, and perhaps a very few other books. An interesting sidelight is to compare the sales of the U.S.P. XI and the N.F. VI with the number of registered pharmacists (100,000) or the number of drug stores (60,000) in the United States. (U. S. P. XI to Feb. 28, 1941—56,047; N. F. VI to Mar. 31, 1941—45,659.) Even more startling is the sales comparison of the U. S. P. XI supplement to these figures. (U. S. P. XI Supplement I—12,980; Supplement II—12,646 to Feb. 28, 1941.) It is the general feeling that the practicing pharmacist does not require

many books and this may be true for the way some are operating their stores. There is great ignorance of what a modest library and a good source of current information could do for them. From the viewpoint of professional standing, conversational ammunition for physician and public, and for remaining interested in his profession, the pharmacist could well afford to pay a little more attention to the desirable information made available to him. Until we show evidence of a desire for progress and the means of obtaining it, we will not be given the professional respect we expect.

It is obvious that the place where good reading habits and interest in professional data should be developed is in our colleges of pharmacy. Several articles recently published by Ireland (2), Jarrett (3), Lee (4), and Alexander (5), point out the advantages of library training and how it may be accomplished. Force or threat applied to library training is taboo, but should be substituted with well-thought-out assignments in all courses to gradually build up in the mind of each student the tremendous value and unlimited possibilities the proper use of the library and useful reading offer him. A method tried by the author with some success was to post each week on the bulletin board those recent articles which were thought to be most interesting to the student. Also, when students inquire about some phase or trend in pharmacy I find that it is much better to either give them the source of your information by means of a library reference or to accompany them to the library and show them how to seek out their own answers.

Especially during their junior and senior years students should be encouraged to avail themselves of the free publications and other services offered by many pharmaceutical manufacturers. This would begin to acquaint them with some professional articles and let them see that others besides the immediate faculty were emphasizing the better things in pharmacy. A directly-mailed publication adds a personal touch that pleases the student and would eventually be valuable to the manufacturers. After a short time, when interest in reading has developed, students are more easily convinced of the value of joining the American Pharmaceutical Association and of subscribing to more pharmaceutical literature. Some may even be encouraged to start an indexing or cataloging system, paying special attention to those

phases which have special interest and value for them. If new members of the profession were so trained, many would be able to convert the older men to the value of reading and spread the idea of keeping abreast of the times. The success of any effort can quickly be observed by noticing whether or not the seniors practice their time-honored tradition of discarding textbooks immediately upon completion of their college course.

The following publications are available from pharmaceutical manufacturing companies. These journals are, of course, for the personal advertising of the company and generally contain articles relating to their products, but most of them will be found to contain many worthwhile facts and ideas:

- | | |
|----------------------------------|-----------------------|
| 1. Tile and Till..... | Eli Lilly & Co. |
| 2. The Merck Report..... | Merck & Co. |
| 3. Modern Pharmacy..... | Parke, Davis & Co. |
| 4. What's New..... | Abbott Laboratories |
| 5. Roche Review..... | Hoffman-La Roche |
| 6. Clinical Excerpts..... | Winthrop Chemical Co. |
| 7. Seminar..... | Sharp & Dohme |
| 8. Therapeutic Notes..... | Parke, Davis & Co. |
| 9. Squibb Memoranda..... | Squibb and Sons |
| 10. Index of Endocrinology..... | Armour & Co. |
| 11. Physicians Bulletin..... | Eli Lilly & Co. |
| 12. Merck Service Bulletins..... | Merck & Co. |

A survey of about fifty drug stores throughout the country revealed that only about three of the above publications were being received and that the others were not even known by the pharmacists to be in existence. Of course it is possible to get along without any of them, but it appears that some good could be obtained when the only effort required is to read. If pharmacists are by circumstances the dispensers of many ready-made pharmaceuticals, they should learn as much about them as possible and who is a better teacher than the makers of these products?

1. Kirsch, Wm. E., *A. Ph. A. Pract.* Ed. 1-329-1940
2. Ireland, Ed. J., *Am. J. Pharm.* Ed. 3-27-1939
3. Jarrett, Wm. A., *ibid.* 3-225-1939
4. Lee, C. O., *ibid.* 3-24-1939
5. Alexander, Caster, *ibid.* 2-172-1937

An Outline of Material Suggested for the First Year Course in Pharmacy*

CHARLES V. NETZ

College of Pharmacy, University of Minnesota

This forum is intended to provoke discussion out of which may come a better plan for imparting to the first year pharmacy student the fundamentals necessary for an understanding of the subjects which he will pursue and at a time when, and in a manner that will arouse and maintain his interest in his future profession. It is obvious that a very large factor in the success of this plan is the ability of the instructor to present the subject matter in an interesting way.

The clock hour assignment for the subjects is made upon the semester basis because this system is followed in the majority of colleges.

Pharmaceutical Latin.—First semester, 16 didactic hours, 16 total hours, 11½ credits. Modify the course content in the Syllabus (p. 92) by limiting the number of words sufficient for the needs of the pharmacist and commensurate with the time available. This would mean about four hundred nouns, and the verb forms would include the imperative, the present, active, and passive subjunctive, third person singular, and the gerundive.

History of Pharmacy.—First or second semester. 16 didactic hours, 16 total hours, 11½ credits. Follow the subject content as given in the Syllabus (p. 76). Changes or additions may be made to include additional historical and factual material applying to the individual college. The development of pharmaceutical organizations, literature, laws, and economics in the United States should be included, as well as the historical development of systems of weights and measures, thermometers, and pharmaceutical processes.

Theory and Technique of Pharmacy.—First semester.—32 didactic hours, 32 laboratory hours, 64 total hours, 4 credits. The lectures should include the material listed in the Syllabus (p. 112) under "A-Specific Subjects" and such additional material as may be necessary for an understanding of the

*Read before the Conference of Teachers of Pharmacy at the 1941 meeting at Detroit.

laboratory work. Omit the history, if it is included in another course. The laboratory work could include practice in weights and measures and in the use of the various types of balances; specific gravity determinations for liquids and solids; the determination of the volumes of drops and the capacities of the ordinary teaspoon and tablespoon; experiments in ignition (ash determination), calcination, volatility, sublimation and boiling point determinations; the preparation of stock solutions and triturations, percentage solutions and solid dilutions from pure chemicals and from solutions and triturations; the determination of the solubility of a salt in water, and one experiment in dialysis. Other operations and practices mentioned in the Syllabus under "Pharmaceutical Technique" (p. 108) are, or may well be included in other laboratory courses, such as simple and steam distillation in organic chemistry and crystallization in inorganic pharmaceutical chemistry.

Operative Pharmacy.—Second semester. 16 didactic hours, 32 laboratory hours, 48 total hours, $2\frac{1}{2}$ credits. The lectures should include a study of waters, syrups, infusions and decoctions. In the laboratory the student should prepare at least four waters including Cinnamon Water using magnesium carbonate to illustrate the unsuitability of many supposedly insoluble and inert compounds as distributing agents; Simple Syrup by both processes, Syrup of Ferrous Iodide, Syrup of Tolu Balsam or Syrup of Ginger, Syrup of Wild Cherry or Compound Syrup of White Pine; the Infusion of Digitalis and a decoction.

The four year course in pharmacy usually consists of the equivalent of one year of study of cultural subjects and of three years of study in the professional field. Since many students enter colleges of pharmacy with advanced standing, and with a sufficient number of credits in academic subjects obtained elsewhere to enable them to begin the professional studies immediately, it would seem desirable that the curriculum and class schedule be so arranged that they can secure a degree with three additional years of professional work. This can be accomplished only by the inclusion of all academic work in the first of the four years. This segregation means that freshman pharmacy students learn nothing of the profession of their choice during the first year. Some lose interest and do unsatisfactory work or else they transfer to

some other course at the end of the school year.

The preparation of medicines, even of the simple type, is of great interest to the beginner. Hence, a course in operative pharmacy is included in the second semester of the first year. The manufacture of the preparations enumerated requires only a knowledge of the fundamentals covered in the first semester.

Assuming that the balance of the work in operative pharmacy is completed in the second year, the transfer student, who enters with advance standing, would in his first year of professional study take the subjects outlined above. In his second year of professional work, he would take the courses offered in sequence. In other words, the pharmacy classes in the first year would consist of freshmen and sophomores and the sequence courses in the second year would consist of sophomores and junior.

Discussion

R. E. Terry, College of Pharmacy, University of Illinois. In the history course, a general survey of subject matter should be attempted. The student is not ready at this stage to conduct searches into the history of pharmaceutical preparations. This must come later when he is familiar with the entire scope of the subject. However, much can be taught in a general way which will orient the student and give him an understanding of what pharmacy really means. In the pharmacy laboratory the acquisition of manual skill is stressed. If the student shows definite lack of ability in technique, the first year is the time to determine this and either train or exclude him from future courses. The laboratory exercises include operations which have subsequent applications. Pharmaceutical arithmetic can be worked into the laboratory exercises, thus making the subject most practical. The transfer student who presents advanced credit should not be permitted to double up to save time. Course sequence is of more importance to the student than "cashing in" on credits earned previously in another curriculum. While there may be valid reasons in some cases, many changes are unwarranted and we should not cater to these students.

Harry W. Mantz, College of Pharmacy, Temple University. Latin in pharmacy schools is a specialized course and it might be advantageous to students if it were presented in conjunction with prescription compounding or, during the year in which compounding is taught. The student, by this time, has a background in pharmaceutical training and has memorized many of the official Latin titles of drugs and preparations. It is my opinion that there is no more need for a course in technique of pharmacy than in the technique of chemistry, physics or any subject of this nature. This course as outlined in the Syllabus overlaps with chemistry, physics and operative pharmacy and for that reason, can be presented in conjunction with these courses. For instance, wrapping and tying packages can be taught in prescription dis-

pending; specific gravity determinations, heat and regulation of temperature in the course in physics. Preparation of the various types of solutions, extracts and emulsions could be, and is in most cases, included in the operative pharmacy laboratory. Recovery of alcohol is carried out frequently in organic chemistry and crystallization, precipitation, exsiccation, desiccation and carbonization are covered in inorganic chemistry. The entire four years of a pharmacy course are a development of technique and it cannot be developed in a semester or two. I question whether the student will perform intelligently many of the operations listed under technique until he has had a year of chemistry and a year of physics. I agree that the first year pharmacy student should have fundamental work in pharmacy and we include in our first year curriculum both theoretical and practical pharmacy. This not only creates more interest, but it also helps the student who has never been employed in a drug store. In order to meet the needs of the students who have advanced standing, our second year curriculum does not include a course in pharmacy laboratory work. This enables the transfer student to enter the pharmacy laboratory with the first year student. Extra hours are added to the third and fourth year laboratory courses to compensate for those omitted during the second year. This meets the requirements not only for the student but also of the Syllabus.

Courses In Pharmaceutical Economics*

C. LEONARD O'CONNELL

University of Pittsburgh, College of Pharmacy

A study of programs in pharmaceutical economics reveals that the amount of time devoted to so called economic subjects in colleges of pharmacy on an average is about one hundred and thirty-six hours in the four year course. The range in time was from eighteen hours (lowest) to two hundred and eighty-eight hours (highest). A substantial majority of schools (thirty-three out of a total of fifty-one) did not favor any expansion of their present programs. This would seem to indicate that present prospects for the inclusion of any considerable amount of economic training in the undergraduate program in pharmacy is altogether unlikely in view of the fact that present curricula are already crowded and there is fairly common agreement that it would be unwise to increase the hours in the course.

However, the problem presented to your committee was to submit a schedule of courses that might well be given

*Read before the Conference of Teachers of Pharmaceutical Economics at the 1941 meetings at Detroit.

provided that such courses could be justified and that the time required to give them could be found in the curriculum. Viewing the problem from the educational point of view, one would certainly feel constrained to say that the job of training students to function as practitioners of the art of pharmacy certainly is a sufficient task for a complete undergraduate program. To complicate this program by attempting to set up an extensive business training, which in the opinion of most competent observers could only be done at the expense of the basic scientific training in present courses, would be educationally indefensible. There would be a great danger, if this were attempted, that the result might be that we should ultimately fail to do a good job of either.

An objective appraisal of the data at hand from the schools reporting a total of fifty-one clearly indicates that an attempt by any group, however competent, to set up an ambitious program in economics would, in this writer's opinion, be wholly gratuitous. What we shall attempt to do at this time is to submit a few tentative programs and ask that in discussion we try to justify their inclusion in the pharmaceutical curriculum from the value of the subjects suggested *per se*. Following this we may attempt to justify their inclusion from any significant values they may have to the pharmaceutical curriculum as part of a general whole.

Following are given three suggested schedules of economic subjects which are submitted as a base for discussion.

The present syllabus recommends the following:

| | | | |
|----|--------------------------------------|-------------|-----------|
| A. | Economics (General) Required | 96 didactic | 96 hours |
| | Principles of Accounting I | (Optional) | 96 hours |
| | Didactic hours | 32 | |
| | Laboratory hours | 64 | |
| | Merchandising, Advertising | (Optional) | 128 hours |
| | and Salesmanship | | ----- |
| | Didactic hours | 64 | 320 |
| | Laboratory hours | 64 | |
| B. | Another suggested group of subjects | | |
| | Principles and Problems of Economics | | |
| | Didactic hours | | 96 hours |
| | Fundamentals of Accountancy | | 64 hours |
| | Retail Drug Store Management | | 64 hours |
| | Sales Principles | | 64 hours |
| | Business Correspondence | | 48 hours |
| | | | <hr/> |
| | | | 336 hours |

| | |
|--|----------|
| C. Another suggested group is as follows | |
| Principles of Economics | 96 hours |
| Business Administration | 48 hours |
| Merchandising Operation and Control | 48 hours |
| Salesmanship | 32 hours |
| Advertising | 32 hours |

256

Some Observations Concerning a Syllabus of Commerical Subjects in a College or School of Pharmacy*

JOSEPH H. GOODNESS

Massachusetts College of Pharmacy

Before any syllabus can reasonably be suggested for commercial (pharmaceutical economic) courses in colleges or schools of pharmacy, some consideration must be given to definitions and conditions presently and generally existing in the field of "pharmacy". Since the title "pharmacy" applies equally well to manufacturing (growing, collecting, creating) or marketing (wholesaling, detailing, retailing) activities, and colleges or schools may have both undergraduate and graduate divisions, it is necessary at the very start to define a college or school of pharmacy (for purposes of the syllabus) as an institution of undergraduate grade teaching pharmacy from the "retail" point of view. If these restrictions are not observed, a syllabus cannot be imposed with justice upon all schools to which it will be applied. The "common denominator" of all pharmacy schools fulfilling the minimum requirements imposed by the community—those which justify the school's existence—should be the approximate required standard for all schools subject to the syllabus and it should also influence syllabus contents. This standard requires that pharmacy schools teach their students such material as will prepare them to serve the people in what is called "retail" pharmacy. If a few schools are so fortunately organized that they can offer to a few undergraduate students courses in fields of

*Read before the Conference of Teachers of Pharmaceutical Economics at the 1941 meeting at Detroit.

pharmacy, either advanced or specialized, that should be a matter of personal pride rather than general requirement. A syllabus for all schools of pharmacy should, on the other hand, allow for a gradual advancement of the profession in the retail field, and not stop at the exact minimum set by present day demands of a community. If these community-set standards are not maintained within reason, either because lesser or greater standards are set, the community through concerted action (laws) or through the operation of our economic system of free enterprise (competition) will force schools to follow rather than lead in their own profession. These truths can apply equally well to commercial or scientific parts of the pharmacy school's curriculum. Schools enjoying monopoly conditions may delay the enforcement of community demands but cannot stop them. All syllabus committees should, therefore, be composed of specialists of both the scientific and commercial fields if a well balanced outline of courses is to result.

Far from ideal conditions exist in schools of pharmacy in the matter of commercial training. Some of these conditions cannot be changed while other may be altered by a syllabus, but all should be borne in mind by a syllabus committee. A few of the more pertinent observations follow under three headings.

College Conditions. Since many schools of pharmacy are parts of universities and the teaching staffs devoting their teaching time exclusively to pharmacy school work are generally small, students of the pharmacy schools must acquire their commercial training in the business schools of the universities. Instructors in such business schools may or may not adapt the business principles to retail pharmacy work. Occasionally this deficiency is made up by special adaptive commercial courses given by the pharmacy school staffs. About three quarters of pharmacy school graduates enter retail practice. Commercial courses in some pharmacy schools are taught by men who must also carry a heavy "scientific" teaching load. Many commercial teachers in pharmacy schools have not had both a business (or law) and a pharmacy training. Courses in commercial work are not largely directed to retail practice in some schools. Alumni request commercial subjects for refresher course programs—occasionally this demand is greater than that for scientific sub-

jects. Lack of cooperation may exist between scientific and commercial divisions of a school. Commercial subjects may be taught by visiting lecturers, which practice may result in an unbalanced and unintegrated commercial training. Courses of non-commercial nature are credited as commercial courses, notable among them being mathematics, languages, and public speaking.

Outside Conditions. Merchandising practice in the drug store is increasing annually—even in the prescription department, where less compounding is now required. Employers demand some basic commercial training of pharmacy school graduates. New laws concerning drugs are increasing. It is to be noted that commercial organizations are taking the initiative since schools have failed to do so effectively. Trade papers and journals are devoting as much or more space to commercial subjects as is devoted to scientific matter.

Ideal Conditions. An idea of what constitutes ideal conditions for teaching commercial subjects in schools of pharmacy may be influenced by the experience of a commentator, but it would appear that all should agree that the following conditions are basic. Teachers of commercial subjects should be specialists: have both a business (or law) training as well as one in pharmacy. Teachers of commercial subjects should devote all of their teaching efforts to commercial work since there is as much study required to keep up to date in this field as there is in any other division of pharmacy. All cultural or non-commercial subjects should be omitted from "commercial credit" lists. Commercial subjects should be taught from a "principles" approach, although "case method" may be used to supplement it.

It is upon the grounds already stated that the author recommends that the following subjects (in the order of preference) be made "required" in a syllabus for colleges and schools of pharmacy offering but one undergraduate curriculum: (1) pharmaceutical jurisprudence, (2) drug store management, and (3) salesmanship. As "elective" courses under like conditions the following are suggested: (1) Advertising and display, (2) bookkeeping, and (3) commercial law.

Personnel, Lighting and Store Location as Factors in Merchandising*

D. B. R. JOHNSON
University of Oklahoma

Professional and commercial pharmacy cannot be separated to any great extent and compete with other lines of business as they now exist in the United States. Many manufacturing houses will sell through every possible outlet. This is shown by the sale through every conceivable channel of vitamins, insecticides, poisons, blood tonics, many kinds of drugs, and preparations needed for cosmetic treatments and sick room necessities of all kinds.

With the doctor frequently telling his patient to buy a bottle of this or that, it is up to the pharmacist to make his store enhance his professional prestige and improve his service so as to better meet the competitors. To do this, the personnel of the store is, in my opinion, the most important. An atmosphere pregnant with friendliness, confidence and dignity must be produced. The personal appearance of the staff must be neat, well-dressed and free from anything repulsive. A perfect understanding between the manager of the store and the help is essential if a perfect personnel is to be developed. Each employee should understand the exact minute he is to be on duty and when he is to be relieved of the work. A definite outline of the work to be done besides serving the customer, such as dusting, washing, invoicing, or placing goods on shelves, should be made. The amount of free goods such as drinks, candies, cigars, and the discount if any, allowed employees on goods purchased from the store should be understood before service is begun. I am of the opinion that no free goods or discount should be allowed. Employees, of course, should be paid a fair salary. If discounts are permitted, then clerks should not be allowed to buy at discounts, and sell to friends. This breeds dishonesty, and the owner loses a legitimate profit, such practices breed discord and lack of confidence between owner and employee.

The location of the store has much to do with its success,

*Read before the Conference of Teachers of Pharmaceutical Economics and the 1941 meeting at Detroit.

although people will frequently inconvenience themselves to be served by people they like. In placing a store it is well to check the number of people who pass daily by walking and by various modes of transportation. The more people that can see your windows, your name, and your establishment, the less cost you will have in advertising your name and the less cost you will have in advertising your place of business to the public. Money spent in advertising would be more profitable if used for attractive and unique store decoration. Parking space is a feature that should not be undeveloped. These features will vary depending on the kind of a neighborhood the store serves. If the store is on a busy street, an attractive store front and interior is necessary, otherwise the throng will not stop. In a neighborhood store, there is more leisure and the employee who is a good conversationalist is a great asset. If the store is in a factory section, it is sometimes an error to have the store too fancy as the grimy worker may hesitate to enter for fear he will feel out of place. Wherever the location, the economic status of the people living in the neighborhood is always an important factor, and this includes the prospect for continuous employment of the residents. It is evident that goods should be properly displayed in any store. Even in small stores departmentalizing may be of value, at least, goods of a similar nature should be grouped and properly labeled so that the customer can easily locate what he wishes when he enters the front door. Small cash registers and small wrapping counters at various places in the store will save the salesman's energy and the customer's time. Frequently a telephone with extension cords is a great convenience. A show case with casters which may be easily pushed the length of the store may be very useful in displaying seasonable goods quickly. The value of proper lighting and the decorating which go along with it are too frequently neglected. The lighting of a store is such an important factor that advice should be sought of lighting experts. Experiments may be both expensive and unsatisfactory in their results. The proper illumination is so important in the sale of merchandise that one cannot afford to depend upon an amateur if he expects to obtain the best results.

Correlation of the Teaching of Dispensing Pharmacy and Quantitative Analysis*

ELMER M. PLEIN and EDGAR A. KELLY

College of Pharmacy, University of Washington

In an attempt to solve certain problems which frequently confront teachers of dispensing pharmacy and quantitative analysis, we have developed a correlation between these two courses. The problem of 'what to do with the student preparations after they are graded' has perplexed many teachers of dispensing pharmacy. The students are instructed to compound their prescriptions with the greatest possible care, and this they do until they discover that their preparations are finally discarded into the trash-can. In order to overcome the resulting relaxation in compounding efforts, outstanding preparations were selected and displayed with identification cards in a 'case of honor'. This well-lighted case is conspicuously located in a hallway of the college and the contents are frequently changed so that the works of many students appear during the course. The case of honor has encouraged a considerable amount of pride in workmanship, but inasmuch as only a small proportion of the prescriptions compounded by an average class of fifty students could be displayed, the majority of them were still relegated to the trash-can.

Therefore, in order to utilize more student preparations, a plan was devised to use them in quantitative chemistry. This plan, in turn, helped to show the direct application of analytical chemistry to the study of pharmacy and resulted in the cultivation of continued enthusiasm in the students. The prescriptions compounded in the dispensing pharmacy are graded and held in reserve until such time that they can be analyzed in the quantitative chemistry laboratory. When the students in quantitative chemistry have gained sufficient experience and technique in analysis of pre-determined unknowns by a particular type assay, they are given those prescriptions which are applicable.

A representative list of preparations analyzed is as follows: Sedlitz powders, aspirin capsules and tablets, powder papers and cap-

* Read before the Conference of Teachers of Chemistry at the 1941 Detroit meeting.

sules containing mercury with chalk, calomel tablets, preparations containing iodides, bromides, arsenic, iodine, ferrous carbonate.

The samples are assigned by code number so that the students are not aware of the identity of the compounder (and in some cases the labeled amount of the active ingredient) until all results have been reported, tabulated, and posted in each laboratory. Since the courses are taken simultaneously it is possible that a student may be assigned his own preparation for analysis.

To illustrate the data posted, a few results from the assay of calomel tablets have been selected at random and are here presented:

| Sample No. | Compounder | quantity | Analyst | Labeled Quantity found |
|------------|------------|----------|---------|---------------------------|
| 1 | A | 0.32 | G | 0.31 |
| 2 | B | 0.26 | F | 0.22 |
| 3 | C | 0.25 | B | 0.28 |
| 4 | D | 0.25 | D | 0.48 |
| 5 | E | 0.25 | H | 0.60 |

In general, concordant results were reported, but not infrequently, certain discrepancies were noted. As illustration, student D, of average ability, analyzed his own preparation and found that the tablets contained approximately twice the stated quantity of calomel. The student was asked by each instructor to review in detail the method of preparation, the procedure for analysis and to account for the difference in values. In example five, both compounder and analyst were considered better than average students, yet the analyst found that the tablets contained no calomel. Qualitative tests proved the presence of strychnine. Since both strychnine tablets and calomel tablets were prepared in consecutive order in the dispensing laboratory, it was evident that a mistake had occurred in labeling the products. Needless to say, the student was made to realize by this illustration and personal discussions the responsibility which is invested in the pharmacist. The avoidance of such error is constantly stressed in the course, but it can happen in any college or any pharmacy. The discovery of that mistake taught the student a lesson which will always remain with him. The object lesson to the class is apparent.

It should be here stated that neither instructor attempted the laborious task of determining the exact amount of active ingredient in each preparation. Since there was no definite

proof of the accuracy of the labeled or determined amounts, tangible evaluation of the students' results was not possible in most cases. However, during three years of use, the plan has produced definite beneficial results.

The Teaching of Organic Pharmaceutical Chemistry*

LOYD E. HARRIS

School of Pharmacy, University of Oklahoma

Many graduates have told the writer on returning to visit their school that the course in organic pharmaceutical chemistry had been of more benefit to them than any other. It is realized that some of it may be flattery, but it so happens that the course is not the only one taught by the writer.

It is agreed by all pharmacy schools that their students should have some training in this field. They are not in full agreement as to how or when, they want it presented. After the present symposium on the subject, it may be presumed that we shall not have reached any definite conclusions, or perhaps that none of us will have changed our opinions on the subject.

The writer, when requested by your chairman, to present his ideas on the teaching of organic pharmaceutical chemistry, agreed to do so with some reluctance. Not being a crusader by temperament or training, the following is presented as a brief survey of fifteen years experience in presenting such a course to pharmacy students of junior standing in a state university.

The minimum prerequisites are qualitative analysis and five semester hours of organic chemistry. This organic chemistry course is the one offered to meet the standard requirements for admission to medical schools. Some of the students have had the regular two semester course in organic chemistry offered for chemistry majors, chemical engineers and other especially interested in the field.

Thus the organic pharmaceutical chemistry course is

* Read before the Conference of Teachers of Chemistry at the 1941 meeting at Detroit.

based upon the foundation of fundamental organic chemistry. The students are familiar with the nomenclature, with types of organic compounds, with general and specific reactions of certain groups and with some syntheses. It is true in some cases that chemicals of therapeutic or pharmaceutic importance are used as illustrative examples, but this is not very frequent. When the pharmacy student has completed his basic course in organic chemistry, he is still not informed, to any appreciable extent, about the compounds with which he will come in contact in the every day experience in his profession.

The primary purpose of the course under discussion is to present these many compounds in some manner so that the graduate will be familiar with them. As a result of his studies, he should also be able to keep abreast of the times and be informed about the many new items that are constantly being introduced.

The student may have a casual interest in the synthesis of a compound. But, the compound has already been synthesized before it comes into the hands of the pharmacist. His job then is to know how to preserve it and how to dispense it properly. Can it be compounded with other substances without chemical change or must it be kept to itself? It is believed that you will agree that the pharmacist must be familiar with the physical and chemical properties, or be able to find, and intelligently interpret, the information when needed.

The course is started by a brief review of the principles of organic chemistry. This usually requires about five to six sessions of fifty minutes each. This is followed by a brief study of the hydrocarbons in which the mineral oils, petrolatum *etc.*, are included. Alcohols are presented next. Here the three U. S. P. concentrations of ethyl alcohol are given as well as the subject of denatured alcohol, rubbing alcohol compound, and isopropyl alcohol, *etc.*

From this point, the writer has not been satisfied with any method of presentation. The classical method of presenting it from a purely chemical approach was tried but this was replaced by a classification based on pharmacological action. Under each heading, where possible, the compounds are grouped under their proper chemical class. This method has many advantages, the most important one being stimula-

tion of interest on the part of the students. All teachers know the importance of this factor. Using the hypnotics as an illustration, the barbiturates are all necessarily grouped together, but we have the soluble barbiturates which serve to emphasize an important property of this class of compounds.

The U. S. P., N. F., and N. N. R. compounds are given special attention. Occasionally some of the non-accepted items are discussed. If possible, the U. S. P. substances are thoroughly studied then the others may be left with the accepted name or names, chemical name and formula, and any special properties that may not belong to all other compounds in the group. A bit of pharmacy is also presented in that the forms for administration are given, i.e., tablets, elixirs, *etc.*

Each student is encouraged to prepare an index file of information, either on cards or of the literature available on each of the compounds studied. Some of them have continued to keep this file up to date after graduation and report that it is very much worthwhile.

In the laboratory period each week, typical compounds are taken as illustrative material. Solubilities, stability in solution, chemical reactions and tests are actually tried by the student. In some instances they may prepare some of the pharmaceutical preparations containing them. Of course no laboratory would be complete without the note book. At the close of the semester, the students are required to make an invoice of the compounds studied that they find in the prescription department of one of the local drug stores.

It is realized by all that organic compounds make up a large percent of the materials of medicine today. The pharmacist, by virtue of his professional training should be in a position to give correct information and sound advice to the physician, the dentist, the nurse and to anyone else who may need such information. To do this he must be well informed, not only about the old, but about the new. It is the sincere belief of the writer that a course such as has been suggested will be of definite benefit in the training and life work of the pharmacist. The methods of teaching may be different but we all surely agree that the objective should be the same.

A Situation and a Plea

L. WAIT RISING

College of Pharmacy, University of Washington

This paper is an outgrowth of a group discussion at the last meeting of District Number Seven of the Boards and Colleges on the subject of increasing the dentist's use of pharmacy. No issues were settled, nor were any programs for improving pharmacy-dental cooperation developed. One fact, however, was unconsciously spotlighted and it had no relation to the subject in hand. It was that colleges of pharmacy are, generally speaking, more concerned with building up or maintaining enrollments than with the enlargement of professional need for the matriculants after graduation.

Colleges that can see no further than their immediate enrollment problems are both extremely selfish and near-sighted. It is true that enrollment and budget are intimates and often grow or shrivel in direct proportion to each other. It is equally true that the amount of professional service to be performed and true professional employment for graduating pharmacists are intimates.

Thus we have two opposing sets of conditions facing the colleges. One, the need for enrollment to maintain budgets. The other, the fact that to perform the professional work of pharmacy today we need scarcely half the graduates we hope to turn out each year. Is it fair to enlist young men and women for four years of professional academic work knowing full well that the majority can be only clerks after graduation?

It is true that to staff the drug stores now in operation we need the full present college enrollment and perhaps even more, but it certainly cannot be said that it requires many new graduates each year to keep up the *pharmaceutical* services performed in those stores. A big percentage of the retail units fill one or two prescriptions per day. The majority of stores fill five or less new prescriptions per day.

Is it right, when there is so little pharmaceutical service for our graduates to perform, to be so concerned about increasing our enrollments and so thoughtless about the professional future of those we welcome within our halls?

I realize that some colleges are devoting their major energies to promoting an increased use of professional ser-

vice. They cannot be too highly complimented, but they are in the minority. The staffs of the majority are busy either doing nothing or researching in fields unrelated to the activities of even the truly professional stores. They are earnest and sincere and many of them are my very good friends, but their efforts are in large part misdirected. Their presence on the faculties of colleges of pharmacy is public assertion that they have dedicated their lives to the profession. Yet they do very little to keep it flourishing or even alive.

To get back to the meeting of District Number Seven for substantiation of what I have just said; it was pointed out there that Dean Spease, Dr. Andrews, Dean Schicks, and others have developed promotional campaigns for pharmacists to use which will make physician, dentist, and pharmacist alike prescription conscious, pharmaceutical service conscious and cooperation conscious. These campaigns have the stamp of successful use already on them. We know they work because they have been clinically demonstrated. They are not hard to use, but they do require introduction into new territories and constant supervision of their use. This is true of any successful advertising campaign. It is also true that successful advertising campaigns are the life blood of organizations using them.

All we needed in District Number Seven was to find strategically located bodies to introduce and supervise the work. The faculties were the logical starting points. Their reactions were, almost unanimously, that our national organizations should carry the load, that enrollment is our problem; creation of services for that enrollment to perform after graduation is the responsibility of national organizations. Could anything be more illogical? A farmer doesn't furnish farm hands, then ask some national organization to produce a crop for his hands to harvest. He has better sense. Surely, we are as smart as he.

My plea is let us work this game from both ends. Be concerned over maintaining our student-bodies, but at the same time let us *all* work harder than ever at promoting the growth of the profession into which we graduate the students. Let us not turn deaf or unenthusiastic ears to the importuning of Spease, Andrews, Schicks, Strother, and others when they offer us practical tools for increasing professional service.

Let us remember that our responsibility includes both manning the ship of pharmacy and maintaining it in top professional form.

What is to be Gained by Speeding up the Educational Program*

LESLIE B. BARRETT

University of Connecticut College of Pharmacy

After fighting a war during nineteen seventeen and nineteen eighteen "to end wars" and "to make the world safe for democracy", we find ourselves in nineteen forty-two engaged in the most formidable of all wars "to save freedom". War, with its disastrous and terrifying events, with its urgent demands for materials of destruction, and the need for men and substance to carry on its ruthless devastation, affects the lives of all persons in the nation just as a stone dropped into a pond disturbs the equilibrium of that water in ever widening circles until the effects may be recorded on its farthest shore. War, then, is a time of change—of many changes; a time, often, of hysteria and of misdirected and wasted effort. Let us, therefore, consider whether or not a change is desirable in the routine of pharmaceutical education.

If there is to be any change in our curriculum this should be based upon the possibility of a present shortage in the ranks of pharmacists, the need of increased numbers within the next few years, or for more adequate training of students. If there is a shortage at present, where does it exist? Reports indicate that there is a large number of pharmacists in the Army and Navy who are not assigned to pharmaceutical work. Before concluding that there is a scarcity in civilian life we ought to determine whether there are not enough pharmacists to carry on the professional service required in any community, or is the problem one of deficiency of drug store "help" to satisfy a circumstance created by what may be too many existing drug stores.

*Read before the annual meeting of Boards and Colleges of Pharmacy, District No. 1, Providence, Rhode Island, March 30, 1942.

Providing there is a lack of pharmacists, then there must be an insufficient number of students in our colleges of pharmacy, since nearly every state now requires graduation from a four year college course as prerequisite for examination by a licensing board. Perhaps this is true. Assuming that it is, where does the fault lie? I doubt that it can be attributed to the present emergency, for this is a situation that has, to my knowledge, been brewing for the past thirty years. Who among us has ever heard, or known of, a retail pharmacist encouraging young people to enter pharmacy? Every one has heard a pharmacist say that he would do all in his power to discourage a young man from going into that field. Why complain now that the harvest is lean?

Granted there is a shortage, or threatened shortage of pharmacists, what can the colleges do to relieve the condition? Frankly, I believe they can do little or nothing. To bring about changes in the curriculum without due deliberation for the purpose of supplying more pharmacists might menace or undo the efforts of twenty-five years in building up a standard that merits professional recognition. The foundation has been laid, but much yet remains to be accomplished in the superstructure.

One much discussed proposal is to speed up the college program by establishing a trimester system extending over twelve months in order that the course may be completed in three years. This plan, while it appears deserving of consideration, presents serious obstacles. First, it is difficult to understand how this plan would solve the problem. All it could do would be to turn out sooner those already in college; it could not supply graduates in greater number. Instead of taking in one class each year we would have to register two, and since it is now difficult in many colleges to enroll one good-sized group, how is this number to be doubled, particularly since high schools graduate but once a year? Also, and unquestionably important, many students depend upon the summer vacation as a time for earning money to finance their education; a point that is even more momentous in recent years when colleges have discouraged outside work during the school term. Again, I believe that among average students, better scholarship is attained following an interlude from class room routine; there is need

for a period of mental relaxation. There is also the possibility, because of monotony and strain, that teaching on a twelve month basis might lower the quality of instruction given.

Another venture might be to eliminate, make changes in, or replace, some of the present courses. Here I wish to direct attention to the proposed compulsory laboratory courses in physiology and pharmacology, for I believe that by such a procedure, applying to all undergraduate students, we are going too far into the field of medical sciences. Perhaps we are doing the same with bacteriology, and in subjects of a purely commercial aspect. We must not forget our primary purpose is to train and educate for pharmacy, and any attempt to make specialists in other fields might be to admit a loss of faith in our own profession. However, before making any attempt to alter our courses, very careful study would be necessary, for all of the major subjects have been included in the curriculum after much thought, and represent the minimum for thorough pharmaceutical training.

For the present we should be wary of making any hasty decisions of basic importance. Rather, our aim should be to direct our efforts toward teaching our courses with greater thoroughness, instilling not only knowledge but infusing the principles of honesty, fairness, decency, and loyalty, traits that develop character. We should do all we can to bring to our colleges, students with higher scholastic standing and better general training. To accomplish this we need the co-operation of the retail pharmacists, for it is they who are a powerful influence in determining the personnel in pharmacy of tomorrow. With their allegiance we need not fear a lack of pharmacists.

Sometime when peace again settles over the earth, it is probable that we shall face a changed world, one in which it may be, that some of our customs and institutions will not have survived. Will pharmacy be able to adapt itself in the new order without sacrificing its objective, namely, the art and science of preparing, compounding, and dispensing of medicinal remedies? If it is to do so we must not deviate from the established principles of our profession; we must be determined that whatever changes may be instituted will be the best in upholding these principles. Let us be cautious in making any fundamental changes in our colleges for the

purpose of supplying graduates in greatly increased numbers lest perhaps we do this at the cost of quality. Members of state examining boards as well as we in the colleges must be extremely watchful at this time for those who would slip by. It would be better—far better—to have fewer graduates now than later to find ourselves in the backwash wallowing in the dregs of our own folly.

Material for a Scheele Exhibition.

There are not many opportunities given to pharmacy to present itself favorably to the world at large. The year 1942 offers one of these rare opportunities. Two hundred years ago a great benefactor to mankind was born who not only emerged from but stayed with pharmacy all his life and considered himself, first and above all, a pharmacist:

Carl Wilhelm Scheele.

If there ever was a man who proved the necessity of science for pharmacy and the importance of real pharmacy for science, it was C. W. Scheele.

The American Institute of the History of Pharmacy has prepared material for a Scheele exhibition consisting of 36 pictures (10 x 12 inches) and mounted on cardboard (22 x 18 inches). These pictures represent a pictorial life history of Scheele. They show the city and the house where he was born, the pharmacies in which he worked, the monuments erected and the medals coined in his honor and finally likenesses of himself and of most of the Swedish scientists with whom he discussed his experiments, investigations and discoveries. Each picture is accompanied by a short legend which is descriptive as well as interpretative. A list of the achievements of Scheele is likewise presented.

This whole material is offered to the American Colleges of Pharmacy at the non-profit price of \$20.00 (twenty). Exhibited within the schools or, on the initiative and under the sponsorship of the school concerned, in some public buildings and given adequate publicity in the local newspapers and by professional as well as open house meetings devoted to the memory of the **pharmacist** Scheele, this material will serve the immediate purpose of a most dignified representation of pharmacy within and without. Also, it will form a valuable permanent asset to the teaching facilities for the history of pharmacy.

This offer is made on condition that at least ten orders be received by the American Institute of the History of Pharmacy, Chemistry Building, Pharmaceutical Library, Madison, Wisconsin, before June 1, 1942.

In this most terrible war of all time the United States of America represent most obviously the side fighting for the maintenance of civilization. Thus, in spite of and because of the war we in this beloved country have to keep the light burning.

The American Institute of the History of Pharmacy
George Urdang, Director

Editorials

The Value of Pharmacognosy to the Retail Pharmacist

Varied opinions exist among the pharmacists of the country as to the value of pharmacognosy to the retail pharmacist. There are some who think that study of plant and animal drugs should have a less conspicuous role in a pharmacy curriculum at the present time. I should like to try and point out that this branch of applied science is of even greater importance than during any of the past decades.

Pharmacognosy has for its object the study of drugs, and the portion of the plants and animals yielding them. The main object is not only to determine the identity of the drug and its origin, but comprises the study of its constituents and the factors influencing their variation. This means that drugs of recognized value are given principal consideration from a pharmacognostical standpoint. The modern pharmacist is no longer called upon to stock his containers with the great number of crude and powdered drugs, which were considered essential necessities in the earlier revisions of the U. S. P. and N. F. He rarely, if ever, has a call for wahoo bark, snakeroot, tamarinds, or tansy tea. Tradition of long usage is not sufficient reason for them to continue to occupy an important function in pharmacy.

Chemical investigation and scientific progress in the more recent years have thrown a new light on the plant and animal products. Many drugs are found to contain one or more active principles upon which the entire therapeutic value and pharmacological action depend. Other drugs contain principles which have defied separation up to the present time, but the chemical and physiological nature of them is more clearly understood. And, also, there are many plant drugs used in medicine that are considered pharmaceutical necessities which may contain only coloring principles, mucilaginous substances or volatile oils. Thus, with the great number of pure plant or animal products and crude drugs of established merit, pharmacognosy becomes a more significant and important science for the retail druggist. His prescription department is stocked with the many and ever increasing principles of

such drugs as digitalis and ergot. The alkaloids and glucoids, volatile and fixed oils are derived from plants with which the druggist should be familiar. The vitamins and hormones and the sources from which they are derived should be of the greatest interest to the professional man or woman who dispenses them.

The student of pharmacognosy is no longer encouraged to study the detailed characteristics of the many almost discarded drugs which found their way into the drug store. It is those drugs which are having better standards provided for them and those products which have recognized pharmaceutical and therapeutic value that the student studies and investigates. After completing his college work and entering the retail field it is to be hoped that he will be imbued with the idea of keeping abreast with the advances in pharmacognosy. His knowledge of plant drugs will not embrace just a large number of the once used products but he will be alive to the progress in the field.

Forest J. Goodrich
University of Washington

Accelerated Teaching Programs

He who falters, delays or strikes in industry, in agriculture, in education, in every type of preparedness activity, is not fully aware that our country is at war with the most able, the most ruthless, the most unrelenting and cruel enemy the world has ever known. Dr. Elliott of Harvard University has appropriately said: "It is better to bomb Tokio than to build air-raid shelters in San Francisco."

The latest information at hand seems to indicate that nearly half of the member colleges of the American Association of Colleges of Pharmacy have already definitely decided to adopt some type of intensified teaching program. In most schools acceleration will begin with the summer semester. With a few it will not be effective until the fall term. The schools that have not definitely adopted a speed-up program are for the most part believed to be undecided at present. Letters indicate that the majority of those in the "undecided group" will find ways and means of adopting the year-around arrangement before the opening of the fall semester.

The Association has no plan at present by which it will make recommendations to its member-colleges with respect to acceleration. No directive suggestion or regulation is contemplated at this time. The matter of acceleration is something that each institution must decide for itself. Bulletins have kept member-schools posted. Data of value have been disseminated. Each Association member knows pretty well what the others are thinking and doing.

A few schools have reported that it will be impossible to adopt an accelerated program. Finances will not permit it. In several schools, where money is lacking, the faculty members have offered their services gratis for the additional work involved. This is more evidence that teachers in pharmaceutical education are anxious to make their contribution in this all-out war against Adolf Schickelgruber. In many schools the staff members are on a twelve months basis, hence the necessity for additional funds for salary is not a problem. There is, of course, always the problem of added costs of operating the laboratories, stipends for graduate assistants, heat, light, gas, water, janitor service, *et cetera*, all of which increases in a definite ratio. Little arithmetic is required to show that three terms of 16 weeks each, in a fiscal year, will cost a third more than the standard two terms previously given in most schools. This is the problem that each institution must face seriously. It is not one that can be dismissed with a half-hearted gesture on the basis that it is not capable of solution.

The American Association of Colleges of Pharmacy has made it possible for any member-school to expedite its teaching program if it desires to do so. The Executive Committee has been authorized to give blanket approval to all member-schools wishing to accelerate their courses for the period of the war. The approval has been given and it is unnecessary to make application for it. It is understood, however, that the quality of instruction and the minimum number of weeks devoted to each scholastic year shall not be less than the standards set forth in the By-Laws of the Association. The quality and the quantity of work offered in the new program must be the same as that previously given under the four-year arrangement. Only the period of time from entrance to graduation can be shortened by making full use of the summer and other annual vacations.

It may be said that changes in the programs of pharmaceutical education, for the duration of the war, are expedient for three specific reasons. They are:

(1) Many schools of pharmacy are colleges within universities. Teaching programs are synchronized with other colleges and departments on the campus. When the university accelerates its teaching program it usually becomes necessary for the college of pharmacy to do likewise. Particularly true is this if there are colleges of medicine and dentistry with which the college of pharmacy has courses in common. On the other hand, in colleges of liberal arts, colleges of pharmacy frequently mesh courses in English, the languages, the biologies, physics, some of the chemistries, economics, mathematics, military, *et cetera*. If the university finds it advisable to adopt a year-around program the college of pharmacy is usually compelled to follow the same pattern.

(2) The only justification for the deferment of students is the shortage of men in the armed forces and the scarcity of replacements. In order to receive deferment a student must be in school except for temporary interruptions. Vacation from June until September is more than a temporary interruption. Some state selective service headquarters have ruled that a student who is not continuously in attendance, excepting for short vacation periods, must lose deferment.

(3) The greatest necessity for a change in programs of pharmaceutical education is that our country is at war. It is facing a situation far more serious than any it has ever faced before. This summer will see the beginning of real sacrifices. The war will actually be brought home to us. Next winter will bring genuine hardships. For these reasons "business as usual" is out in every form of human activity. The priceless item today is time. Every activity of value in the preparedness program must be accelerated. Education, the bulwark of democracy, is no exception. Like all other phases of national defense, education must now move more swiftly. Special training, of all sorts, assumes that kind of importance for the duration.

This may not be a pretty picture. Unity alone will save us; unity born of desperation, in this case.

Some day, probably a long time hence, the world will again be free. When that day comes, we will place our institutional and our personal responsibilities first again. Today

it is a waste of precious time to discuss any aim other than the swift defeat of those who have attacked American soil.

Rudolph A. Kuever
University of Iowa

The Accelerated Program

The replies to the recent survey of colleges of pharmacy concerning the acceleration of the curricula indicate that many are reluctant to accept the fact that we may not carry on "business as usual." They feel that the policy of increasing the time spent in school per year may jeopardize the present position of pharmaceutical education. There is mention of "lowering of standards," the impossibility of returning to the present status when the emergency is past, and the inadvisability of precipitate action without "full knowledge of the facts."

While it is true that the calendar time required for obtaining the degree would be materially shortened, it is difficult to see how this would constitute a lowering of our standards. Under most present plans, the number of clock hours of classroom and laboratory instruction is in nowise reduced. By the elimination of needless vacation periods and unnecessarily long final examination periods, it has been possible to fit the three term schedule into the calendar year. True, this has produced some problems as yet unsolved, but there is no reason to believe that they are insoluble.

Those who fear that we may not return to our present system after the emergency certainly must be found guilty of purely superficial consideration of the implications of the emergency. Our country is at war with a powerful enemy. We have been told repeatedly that unless we shake off our lethargy and complacency and begin to act, we can lose. And it should be clear by now that action must be united and unanimous. Even one small group must not set itself aside in lonely contemplation of what might have been.

It is hardly possible that anyone who has followed recent developments can plead ignorance of facts. While we have not been told the whole story, we know enough to be aware that this is not the time for procrastination. We are called upon to furnish, in the shortest possible time, an adequate

supply of trained individuals both for military and civilian needs. We shall be remiss, indeed, if we do not strive to answer that call.

We are not unaware that some institutions have not adequate resources to finance an accelerated program and that many would experience hardship if it were inaugurated. For those, outside aid shall be necessary and is conceivably possible. However, no such assistance can be expected in the absence of a well-defined, workable plan.

E. L. Cataline

University of Michigan

Regarding an Accelerated Program

In all the discussion regarding the advisability of, or the necessity for an accelerated program for the colleges of pharmacy, the paramount question seems to be whether there is a shortage of pharmacists or not. A consideration of this question at this time would involve a very lengthy discussion because of the many ramifications of the problem. However, it is probable that in the very near future a shortage will exist, if the demand for man power continues to grow as at present.

But whether a shortage of pharmacists develops or not, we should consider the interests of the students in our colleges and these students' relationship to the national war effort. Such a consideration should cause us to do all in our power to enable those in college to complete their training in the shortest possible time or at least to give them as much of this training as we can before they are called into service. This we can do by offering three terms each year, without lowering the standards or curtailing the curriculum.

Then the student who has completed his college work before he enters the service will be better qualified to serve during the war and will be ready to enter his chosen field after the war. Thus, at the present time the student and the nation will profit by the fact that the graduate is better trained, and later the graduate will be that much further ahead. This is particularly important in the event that the war should last several years.

If a long war ensues, many who are now students, but who will later enter the armed services, will not return to

complete their courses unless they have finished most of their undergraduate work prior to their leaving college. For these people an accelerated program, which will enable them to complete as much of their work as possible, will be a decided advantage. It would be disastrous to the students as well as the nation to deny these people an opportunity to do more at this time. They should be allowed to go as far as they can as quickly as they can.

College-trained men, and by that we mean college graduates, are needed. It is our duty to produce as many as we can and quickly. To those who say we may have too many, I quote Thomas Paine in *The Crisis*: ".....Better have too much force than too little when so great an objective is at stake."

Edwin M. Durand
New Jersey College of Pharmacy

The Shortage of Pharmacists

Letters and editorials of other members of faculties of colleges of pharmacy have led me to the conclusion that there is a unanimity of opinion on one point, at least, and that is the need for still more improvement in the professional status of pharmacy, or, more specifically, in the professional attitude of the average drug store. We seem to be agreed that the public would look on pharmacy with a great deal more favor if pharmacy were as deserving as it could (and should) be of the public confidence. The phrase which comes to my mind may be a quotation from the writings of another, but it seems apropos of the situation: *In the eyes of the public, a profession is as good as its ethics*. Amid all the hurry and excitement of a foreign war, the one fight that the leaders of pharmacy must carry on at home is the struggle for better ethics, better professional and educational standards than ever existed before. This is fundamental, not only in pharmacy but in all professions, if we wish to emerge from the war into a better world than we knew before. This does not mean, however, that the colleges of pharmacy can do nothing toward helping in the war effort. If an accelerated program appears to be necessary, I think some concessions should be made to allow for it. There seems to be a distinct difference

between an *accelerated* program for the training of pharmacists and a *lowering* of professional or educational standards. The latter must not be done. For example, no credit should be given for a course which has not been taken. It is entirely possible, however, that existing schedules can be "speeded up" by the elimination of holidays and vacations. Such an accelerated program must not be allowed to get out of hand; that is, the number of pharmacists created must not be sufficient to work to the detriment of the practice of pharmacy. But the present trend of enrollment does not indicate even the remotest possibility of this eventuality. On the other hand, it does seem that the so-called shortage of pharmacists is more a problem of sorely-needed readjustments than of actual numbers of available men. There seems to be little doubt that the number of drug stores is far in excess of the truly professional business available to them, and that at least several of these could more honestly be called "liquor stores" or "general merchandise stores" than drug stores. It is possible that a shortage of pharmacists might correct some of these undesirable conditions and in such a way be a great boon to the profession as a whole. We must realize, of course, that the situation may be different in the various states. There is more possibility of an actual shortage existing in those states where college-prerequisite laws have existed for some time than in those states where the laws are comparatively new. Frankly, I feel that some of us, who have seen graduate pharmacists forced to work for fifteen dollars a week because there were two men for every job, have rather hoped for this "shortage" of pharmacists. True, *we must not allow near-sightedness to interfere with the needs of the armed forces nor the progress of the war*, but, at the same time, we must analyze the situation so thoroughly that we do not mistake a healthy demand for a shortage.

Joseph B. Sprowls
University of Colorado

NOTICE!

The name of the Southern Association for the Advancement of Science has been changed to the Southern Association of Science and Industry.

The Editor's Page

Much water has gone over the dam since Pearl Harbor and so have many of our ideals of education. What happens to the water is of little concern. Being subject to the unchangeable forces of nature we know it will return again. On the other hand, ideals in education are the products of human intelligence and experience and are constantly being bombarded by the whims and the selfish motives of man. Ideals and policies that have been formulating for a century go down with the setting of a sun. And that is exactly what has happened in pharmaceutical education. We have gone into reverse on a basic principle that has been fought for by organized pharmacy through a period of four decades. That basic principle was a respectable educational program with suitable periods for digestion, assimilation, and growth on the part of the instructed and a suitable period for study and rejuvenation and creative thinking on the part of those who instruct. A study of President Kuever's letters would seem to indicate that while most pharmaceutical educators are against a speeding up program in education, collectively they feel that such a program is necessary in order to demonstrate their patriotism and also as an excuse for the deferment of students of pharmacy. Now that a large percentage of colleges of pharmacy have gone to an accelerated program and the American Council on Pharmaceutical Education has assumed a sympathetic attitude, we shall make the best of it. But whether we are conscious of it or not, there will be a tendency for us to return to shorter courses and continuous operation and other cram school procedures against which we have struggled through the years. When one school announces it will admit a class beginning with the summer quarter and make provision for students to enter in September also, without lowering the quality of the work, it is simply fooling itself. When another institution announces it will begin operation on the quarterly basis in the summer quarter, but expects a greatly reduced freshman class, it is difficult to understand how the number of pharmacists produced for the service and for civilian life in a unit of time will be increased. That sounds like the declaration in labor and high up circles, that a 40 hour week will produce more airplanes than a 48 hour week. It does not make sense. A medical dean has already expressed the opinion

that the accelerated program produces unexpected confusion and he shudders to think of what he will be up against when he attempts to return to a normal program. Perhaps the real patriots are the men who refuse to be jittered into acceleration.

The sentiment is being expressed that there will not be much of a meeting in Denver. The reasons stated are all related directly or indirectly to the war. In the college group the accelerated program is the commonest reason given. School will be in session unless all quarters begin and end at the same time. If this were so, advantage might be taken of the two weeks between quarters for convention holding. But this is not to be expected. Among the retail group the shortage of qualified help is a real problem. The increased cost of travel, hotel accommodations, tire shortages and perhaps by that time, gasoline and other shortages are problems that concern us all. This is the time when everything, whether material or spiritual, is being put to the test. This is the time when the forces of destruction are at work and this is the time when the greatest effort must be put forth to repair our fences and build our defenses. In fact, this is the time when we must take the offensive, if what we have already gained in pharmaceutical education is not to be lost and a major part of that effort must be the planning of our educational program for the post war period. It should be borne in mind that it was during the period of the first world war, that pharmaceutical education received its greatest support and made its most rapid advancement. If one needs inspiration, let him compare the status of pharmaceutical education and practice of the pre-world war I period with the status at the present time in every field of human activity, whether it be on our university campuses, in general educational circles, or scientific activities, or the army, or the navy, or the air, or in civilian life. If that picture does not bring inspiration to the soul of the pharmacist, he must be lacking a soul to inspire. This is the time when pharmacy needs to be given the best we have in us if we are to maintain our gains and be able to progress in the post war period.

The Cleveland meetings have become history. Judging by reports from various sources, the special meeting of the

United States Pharmacopoeial Convention accomplished the objectives for which it was called. The reaction on the part of some of the delegates seems to be that it was a costly trip for no other purpose than to cast a vote. It may indicate, however, that the plans for the meeting were so well drawn that there was little or no need for discussion or revision of plans. If this is so and if the changes in the conduct of pharmacopoeial revision are improved the cost and loss of time incurred is of no consequence. Some of the reactions of the medical-pharmaceutical meeting are given on another page by men who were in attendance. The sentiment expressed in these letters to the writer seem to represent fairly well the opinions which have come from other sources and leave the impression that insofar as medical and pharmaceutical collaboration is concerned, the status is about the same as it was before the meeting. And this was to be expected. The writer has never been entirely happy over our general program of fostering professional relationships. Even when the intentions are the best on both sides they smack of patronizing. The key to proper professional relationships is the ability of one profession to give a service that cannot be rendered by another profession. Such a position can be attained only by an educational program that leads to creative thinking and creative doing. When that position is attained we have a profession that has to be reckoned with. A profession that has attained that position does not have to appeal to any other profession for leadership. To be reckoned with, a profession has to find and have leadership within its own personnel. This must be pharmacy's vision and this must be pharmacy's goal. There is plenty of evidence to the thoughtful that this is taking place. When this goal is attained, meetings between the professions will be of great value, not to seek out leadership, but to cultivate a professional comradery which is so essential to cooperation.

The good news comes from Secretary Kelly that the Council of the American Pharmaceutical Association has approved the American Institute of the History of Pharmacy as an affiliated organization. This presupposes the cooperation of these institutions toward the fostering of historical pharmacy to the advantage of pharmaceutical education and practice

as well as to the two associations concerned. The American Institute of the History of Pharmacy has during the first year of its existence rendered a fine service to pharmaceutical editors and pharmaceutical publications. In the case of our own journal, all items of a historical nature are now being checked by the Director of the Institute to the advantage of both the author and the journal and is appreciated by both. The record of American pharmacy will be greatly enriched when all editors take advantage of this service.

When at a recent meeting the Regents of the University of Minnesota rechristened the pharmacy building, Wulling Hall, they did something that has more than a local interest and something that deserves more than a passing notice. What they did was to place upon the campus of one of America's leading educational institutions, concrete evidence of the service of a pioneer in pharmaceutical education and they also placed there, concrete evidence of the value of pharmacy to a nation. We pharmacists built the American Institute of Pharmacy at Washington ourselves and it was a worthy thing to do, although we may have been accused of a publicity stunt. But this action of the Board of Regents of the University of Minnesota is no publicity stunt, it is the action of a group of hard boiled administrators, not easily moved by sentiment. Their action recognizes real values. If the druggists of the State of Minnesota had some part in bringing this about, it adds still greater glory to the accomplishments of Frederick John Wulling. In this, the pharmacists of the nation will take pride.

The passing of Clifford Conklin Glover left a hole in the heart of American pharmacy. He belonged to that group of quiet, unselfish, non glamorous men who build substantially whether they are constructing a house or an educational policy. Wherever men were congregated to develop an aggressive, constructive program in pharmaceutical education professor Glover was sure to be in that group. Like men of his type, he did his best and his most enduring work in his own institution which was his alma mater, but he never lost sight of the fact that he owed his allegiance to the cause of pharmacy far beyond his own university and his own state.

Somewhere on a prancing dun colored bronco on the broad mesas of the land of eternal sunshine rides Walt Cousins of Texas—headed west. Well do I remember in 1936 standing by his side on the hot pavement, in front of the Hotel Adolphus, in Dallas, from three in the afternoon until sundown, in the most withering atmosphere Texas had to offer, to greet two bus loads of cowboys from the panhandle as they came to Dallas for the annual round up of what Dallas had to offer. Not for one moment did Walt leave his post for fear the riders of the range might arrive and he not be there to greet them. I was held to that spot, fascinated by his promise that I was to share the friendship of his friends and with his assurance that once I had met a friend of Walt Cousins, wherever I met him afterwards, I would have a friend, and I have found that it is so. Walt Cousins brought to the pharmacy of Texas, the color, the fighting spirit, and the sense of fairness and justice of the range. He used that color and fighting spirit and sense of justice as an editor and as a board member in the maintaining of the standards of pharmaceutical education and practice in his state. He believed in the universal brotherhood of man and he fought for what he believed. Many are the men who, when the day of the final ride comes, will strain their eyes toward the western horizon for the first sight of Walt Cousins holding the halter of an extra dun colored bronco, bridled and saddled, ready for the ride across the mesa—west. In the anticipation of the fellowship of that ride we find some compensation for the present lonesomeness.

Rufus A. Lyman

JOURNAL EXCHANGE

The School of Pharmacy, University of Georgia offers to exchange the following unbound volumes of the *American Journal of Pharmacy*: Volume, 87 (1915) May, June, July, August, October, December. Volume, 90 (1918) January, February, March, April, May, June, July. Volume, 91 (1919) Two complete volumes, for any volumes of the same *Journal* between volumes 1-81 inclusive, and volumes 92-107 inclusive.

Gleanings from the Editor's Mail

Here is an item that might interest you. I spent three years in the service during the first world war, and I know how good it seems to hear from home. Several weeks ago I started a practice in the senior class of eighteen that will be continued for the duration. Each Friday each member of the class writes a ten minute note to some boy in the service who was with us during the last two or three years and whom they all know. I wrote a note of explanation, put them all in an envelope and sent them off. That boys like it, is evidenced by the fact that, of four written to so far, three have returned answers by return mail. It gets us lots of first hand information that the boys have been wanting to know.

Also, I may have mentioned it before, but do you know of any state where the State Pharmaceutical Association pays part of the seniors expenses to the annual meeting? The Kansas Pharmaceutical Association does, has for years.

LLOYD L. BOUGHTON,
University of Kansas.

March 30, 1942.

In answer to your query concerning our action to the speeding up of our educational program, I am heartily in favor of it. Certainly no hard-earned gains in pharmaceutical education need be given up, as we are not losing quantity, and we hope, no quality of pharmaceutical instruction. We are merely utilizing three months which we formerly let lie fallow in most cases. It seems rather odd that any institution should allow an investment such as most schools have in buildings and equipment to stand without showing any returns for one-third of a year. Furthermore, the trends in education seem to be toward such a program even after the present emergency ceases to exist. I believe that in the near future we are going to see radical changes in our educational system if the amount of smoke released lately is any indication of a fire and pharmacy should be ready to find its spot in the new order. Perhaps this so-called "speed-up" is a step in the right direction.

DONALD T. MEREDITH,
Detroit Institute of Technology.

March 30, 1942.

In regard to the accelerated program, the School of Pharmacy of Western Reserve will continue to operate as usual for the remainder of this school year in order to avoid conflict with the existing pharmacy law requirements in Ohio. However, Western Reserve University has adopted a trimester plan beginning next fall. The School of Pharmacy will in all probability be required to adhere to this plan. The autumn semester begins on October 5, 1942, and consists of 18 weeks including two weeks of Christmas vacation. The winter and summer sessions will consist of 16 weeks each. A week will be kept free at the end of the autumn and winter sessions for Commencement.

Just what effect this program will have on the functioning of the School of Pharmacy is yet to be seen. The Ohio law requires a year of practical experience in a drug store before allowing a graduate to take the state board examination. Only experience obtained during summer months is credited to the student. Unless the present law is modified,

students attending school during the summer session probably will not get credit for practical experience obtained at this time. This situation would in fact delay the registration of pharmacy graduates thus defeating the very purpose of the trimester plan.

MARCH 31, 1942. MALCOLM S. TRUPP,
Western Reserve University.

I wish to congratulate you on your statement as given in President Kuever's Bulletin Number 11.

Our accelerated program has been in progress three weeks and, as I anticipated, it has introduced a factor which those who authorized it did not fully comprehend, namely, the equivalent of an overload.

MARCH 27, 1942. RUDOLPH H. RAABE,
Ohio Northern University.

*With reference to accelerating the course in pharmacy, I offer the following comments, which I hope you will find useful in preparing a good, strong editorial on the subject:

1. The Office of Production Management of the Federal Government, has made investigations and reported that it has not found a national shortage of pharmacists. It has found some shortages in certain localities and these have been recognized by the local selective service board in granting deferments.

2. The Army now numbers about 1,700,000. One pharmacist is required for about every 700 men; therefore, there should now be a total of approximately 2,428 pharmacists in the Army doing pharmaceutical work. No doubt there are in addition, some pharmacists who enlisted and who are not engaged in pharmaceutical work. On this basis, there will be required for the 2,000,000 men to be called in the next draft, 2,897, making a grand total of 5,285. According to surveys made by various agencies, these pharmacists give on the average only one-third to one-half of their time to work which can in any way be considered pharmaceutical. It would, therefore, seem that taking 5,285 pharmacists out of civilian employment would hardly jeopardize the safety of the public. On the basis of the real pharmaceutical service supplied, it would seem that 50,000 of the 105,000 could be taken into the armed forces without endangering the public health, provided, of course, that the remainder would devote all of their time to pharmaceutical service rather than to merchandising, serving lunches, beverages, etc.

The State Director of Selective Service of Virginia made the following statement in a letter to Mr. Winne, written under date of January 3rd, 1942: "We also feel that some effort must be made in order to insure that pharmacists will be continuously and wholly employed in pharmaceutical duties, instead of wasting a portion of their time in administrative and sales work, especially since the shortage of pharmacists

* The above letter came too late for the January issue. Much history has been made since that time and Dean DuMez may feel that the letter is obsolete. However, the Dean states the basic facts concerning the possible need of a greater number of pharmacists so succinctly that the Editor takes the liberty of publishing it.

in the future may prove so acute that it will be necessary to change the laws of some states in order to permit that drug stores may be licensed, with a provision that prescriptions can be filled by a central bureau of registered and qualified pharmacists."

3. I believe it is generally agreed that there are too many drug stores in certain localities. The State Director of Selective Service in Maryland is of this opinion after having made a rather thorough study of conditions in the State. He believes, for instance, that the pharmacists in some of these stores must be taken into the service. He has, therefore, requested the State Pharmaceutical Association to appoint a committee to advise with him with regard to the localities in which there are more stores than are necessary to serve the pharmaceutical needs of the community. This committee was appointed about two weeks ago, but up to the present time, it has not been called upon to function.

4. From data on the enrollment and the number of graduates of our schools of pharmacy (see below), it is evident that our schools are only graduating about enough to replace the pharmacists needed to give adequate pharmaceutical service. On the basis of a replacement figure of 2.52%, there would be required 2900 graduates annually ($2.52 \times 105,000$). If only one-half of these are needed to give the pharmaceutical service required by the public, it would mean that the schools should graduate 1,450 annually, which is not so much below the 1,624 graduated last year. Of course, some of our graduates do not go into retail pharmacy.

| | Total Enrollment | Graduates |
|---------|------------------|-----------|
| 1940-41 | 8,759 | 1,624 |
| 1939-40 | 8,762 | 1,533 |
| 1938-39 | 8,569 | 1,842 |
| 1937-38 | 8,190 | 1,710 |
| 1936-37 | 8,424 | 1,628 |
| 1935-36 | 8,184 | 1,572 |

Frankly, I would be concerned with the number of pharmacy graduates being turned out by our colleges of pharmacy, if it were not for the fact that we still have in the field many more pharmacists than are actually needed to give the public adequate pharmaceutical service. However, it is my opinion that we can go on at the present rate for another ten years before we will reach the level where it will be advisable to make real effort to increase the number of students in our schools of pharmacy. I am hoping that the Government will actually do for pharmacy what some of us have been trying to accomplish for the last twenty years, at least. If we can just prevent the commercial interests, as represented by the National Wholesale Druggists' Association, The Proprietary Association of America and the chain stores from getting control and forcing us to produce more pharmacy graduates, I can see a great future for pharmacy. Please, however, do not quote me in this instance as I already have enough fights on my hands.

5. The matter of accelerating the course in pharmacy should also be looked into carefully from the standpoint of legality. Some of the states have written into their laws that there must be at least a two-month interval between colleges years. Other states require that a candidate for registration must have had four years of drug store experience and that not over three years of credit for practical experience

may be given for college attendance. In this case, a graduate would have to serve a year in a drug store after graduation so that his training time would not be shortened even though the course were accelerated. There may still be other legal conditions which would mitigate against acceleration that I do not think of at this time.

January 30, 1942. A. G. DUMEZ,
University of Maryland.

NEW IN THE FAMILY

Thomas D. Rowe, Jr.—Born February 26, 1942. Son of Dr. and Mrs. Thomas D. Rowe, School of Pharmacy, Medical, College of Virginia.

Clark George Bowers.—Born December 24, 1941. Son of Dr. and Mrs. Roy A. Bowers, School of Pharmacy, University of Kansas.

Kenneth Otto Albers.—Born February 1, 1942. Son of Dr. and Mrs. C. Albers, College of Pharmacy, University of Texas.

William Wallace White.—Born February 28, 1942. Son of Mr. and Mrs. Wallace F. White, College of Pharmacy, University of Connecticut.

John Michael Stoklosa.—Born November 20, 1941. Son of Mr. and Mrs. Mitchell Stoklosa, Massachusetts College of Pharmacy.

William Joseph Walsh.—Born February 24, 1942. Son of Mr. and Mrs. Robert A. Walsh, Massachusetts College of Pharmacy.

Frances Helen Archambault.—Born February 17, 1942. Daughter of Mr. and Mrs. George F. Archambault, Massachusetts College of Pharmacy.

David Jon Gustafson.—Born April 1, 1942. Son of Mr. and Mrs. Carroll B. Gustafson, Massachusetts College of Pharmacy.

Deborah Brooke Goodness.—Born April 5, 1942. Daughter of Mr. and Mrs. Joseph H. Goodness, Massachusetts College of Pharmacy.

NOTICE!

The material for a Scheele exhibit described on page 258 of this issue is a rare opportunity for a school to add to its permanent equipment for the teaching of historical pharmacy whether in the classroom or for public exhibits intended to show the service of pharmacists in the field of science. Order your set before June 1.—The Editor.

JUNE A. A. A. S. MEETING POSTPONED

The June meeting of the American Association for the Advancement of Science at Ann Arbor, Michigan has been cancelled because of changes in the academic sessions at the University of Michigan. Consequently, the next meeting of the Association will be held in New York City during the Week of December 28.—Glenn L. Jenkins, Chairman, Pharmacy Section, A. A. A. S.

Notes and News

University of Colorado, College of Pharmacy.—The report that an alumnus, Lt. Lycergus W. Johnson, had been killed in the Philippines was an error.—John Minici is with the armed forces in Greenland serving as Chief Pharmacist and X-ray technician.—Dr. David W. O'Day and Charles Bloomquist attended a recent meeting of the Grand Council of Phi Delta Chi in Chicago. Dr. O'Day was reelected Grand President of the organization. Among the resolutions passed by the group was one urging that a separate corps for pharmacists be established in the United States Army.—Dean Washburn and Dr. O'Day are working with a committee on plans for the A. Ph. A. convention at Denver in August. Dr. O'Day will again manage the Science Lodge (summer camp) of the University. The Plant Seminar will be held at Science Lodge August 10 to 15. Faculty members of other colleges of pharmacy, who are attending the A. Ph. A. convention, may secure lodging for the duration of the convention at Science Lodge by making reservation through the University.—Enrollment in the College of Pharmacy did not show the usual decrease for the spring quarter of this year.

Creighton University, College of Pharmacy.—Alpha Alpha Chapter of Rho Chi has elected to membership Sebastian C. Pirruccello, Edwin Backer, John Mishler, John Moran, and Charles H. Sprague. The initiation banquet was held on April 15.

University of Connecticut, College of Pharmacy.—Ten members of the Curtis P. Gladding Honor Society became charter members of Alpha Gamma Chapter of Rho Chi Society on January 26 when Dr. E. V. Lynn of Boston, National Vice-President, installed the chapter at this institution. The ceremonies took place at the Graduates Club in New Haven. Up to the present time, honor students have been inducted into the Curtis P. Gladding Honor Society, an organization named for Dr. Gladding of Hartford. There have been approximately sixty-five members of this Society since it was founded in 1929.—Henry M. Nodelman, instructor in physics and mathematics for the past three years, resigned recently to accept a position with the Radio Corporation of America Institute in New York.—Following a custom established four years ago, a series of special weekly lectures is being given to the junior and senior students by specialists in fields related to pharmacy and medicine.—Nicholas W. Fenney, instructor in pharmacy, was elected Grand Counselor of Kappa Psi Fraternity at the annual convention of the fraternity held on December 29, in Philadelphia.

Detroit Institute of Technology College of Pharmacy and Chemistry.—Over 150 registered pharmacists of Detroit are enrolled in a Red Cross first aid course being given by Dr. H. C. Emmert.—Mrs. H. C. Emmert, wife of Dr. Emmert, died Tuesday, March 24.—The College of Pharmacy, along with the other departments of the school, will go on a year-round basis starting a new semester on May 25.

University of Florida, School of Pharmacy.—The Bureau of Professional Relations has inaugurated a new series of publications known

as the "Bureau Series" which is mailed to each drug store of the state with the current Bulletins of the Bureau. A similar bulletin is mailed to physicians. In this way the Bureau is attempting to bring to the pharmacists of the state the practical current pharmaceutical and medical literature in the most concise manner possible. The new publication is the result of a demand for information relative to the current literature.—Lt. David A. Southard is the first graduate of the School of Pharmacy to lose his life in the service of his country. He received the B. S. degree in May 1940, and passed the State Board the following month.—Dr. L. D. Edwards is teaching in several courses given in the Civilian Defense Corps Training Program.—On March 26, Rho Chi initiated three new members; William Scott Ware, Solomon S. Maizel and Jack K. Dale.—The School of Pharmacy is taking part in the University's acceleration program by offering summer school courses which will enable the present junior class to graduate next January. The quality and amount of work are not changed.—Mr. Roy Dean of the Upjohn Company, spoke to Mortar and Pestle on March 12 on detailing as a life work.

Fordham University, College of Pharmacy.—The first group of pharmacists of the Bronx and Westchester area, fifty in number, being trained as first aid instructors under the training program sponsored by the New York State Pharmaceutical Association and the American Red Cross, have been awarded certificates. The presentation was made by Dr. Robert L. Swain.

University of Georgia, School of Pharmacy.—Dr. Robert S. Justice, a former member of the faculty, has recently joined the research staff of the S. E. Massengill Company at Bristol, Tennessee.—Under the direction of Dr. William R. Lloyd, the members of the senior class are preparing a short play, dramatizing the sulfa drugs, to be presented before the Georgia Pharmaceutical Association convention at Atlanta in April.—Mr. John W. Nelson, who has charge of the work in materia medica and pharmacology, has made arrangements to pursue his studies toward the doctor's degree at Purdue University.—Lt. H. Dale Roth is now a member of the A.E.F. as a medical administrative officer.—Dr. W. Taylor Sumerford spoke before the University Chemistry Club at their March meeting.—Dean Robert C. Wilson was named director, from Georgia, of the Southern Association of Science and Industry which met in Atlanta, April 1-2.—Dr. W. Taylor Sumerford attended the spring meeting of the American Chemical Society in Memphis.

University of Idaho, College of Pharmacy.—The enrollment for 1941-42 was 190. This was an increase of 8 per cent over the previous year.—A twelve week term has been planned in pharmacy for the summer session. This will be the only summer session activity in the Southern Branch of the University.

State University of Iowa, College of Pharmacy.—Dean R. A. Kuever has been elected to full, and Larry M. Wheeler to associate membership in the Iowa Chapter of the Society of Sigma Xi.—Roy G. Herrmann, Ione R. Card, Robert R. Clothier, Norman R. Johnson, Edyrn H. Jones, Wayland C. Fuller, Ormond Vander Schaaf and Charles F. Watson have been elected to Rho Chi.

University of Kansas, School of Pharmacy.—A loving cup bearing the names of the twenty-three members of the class of 1902 and given by that class to Dean L. E. Sayre has been presented to the School by the son of the former dean, L. E. Sayre of East Orange, New Jersey.—A loving cup, contributed by the Kansas Pharmaceutical Association has been presented to the School, engraved with the names of the seniors, Lloyd Roser, A. B. Gansz, and John Reynolds, who won first place in the state for a window display in the Round Corner drug store last October during National Pharmacy Week.—Faculty members and senior students attended the Globe Veterinary Program held in Kansas City on February 19. The speakers gave helpful practical information and presented scientific facts on veterinary medicine. The program was sponsored by McKesson & Robbins. It was very much worth while.—The enrollment the second semester is the same as for the first although there is a 9 per cent decrease in the whole University.—Dr. L. D. Havenhill exhibited 16 of his beautiful old drug jars recently at the semi-annual meeting of the American Association of the History of Medicine at the University Medical School at Kansas City.

Long Island University, Brooklyn College of Pharmacy.—Dr. William H. Weygandt has recently undergone a serious operation. He is convalescing nicely.—Dr. John Y. Keur has been granted a temporary leave in order to conduct an official personage from the Netherlands East Indies government on a tour through the eastern and midwestern states, visiting lumber mills, forestry schools, and laboratories.—Emmet J. Doyle has resigned from the faculty and has entered the manufacturing department of Burroughs Wellcome and Company.—Philip Blank, Ph. G., LL. B. has joined the staff as an instructor in commercial jurisprudence.—Prof. Wilkoc and Milana are conducting primary and advanced courses in first aid for graduates in pharmacy. 120 students in the primary course and 20 in the advanced are enrolled.—Dr. Ralph H. Cheney recently spoke over the radio under the auspices of the Brooklyn Botanic Garden on "New Healing Agents from Plants." He has been elected a member of the Board of Managers of the American Institute of the City of New York. He also is representing the University at the 75th anniversary of the founding of the Torrey Botanical Club to be held in New York City, June 22nd to 28th, and is serving on the program committee for this celebration.

Massachusetts College of Pharmacy.—In order to meet the obligations imposed by the wartime emergency, regular courses will be concluded for upper classmen during the summer months.—To assist the Massachusetts State Pharmaceutical Association in organizing the pharmacists of this state for participation in civilian defense activities, a series of courses in first aid for practicing pharmacists was inaugurated recently. There are 150 pharmacists registered in these classes.—Dr. Elliot H. Cutler, Chief of the Committee on Public Safety has complimented the students for their assistance to his division in the preparation of medical supplies for distribution to civilian defense units.

Medical College of Virginia, School of Pharmacy.—A student branch of the American Pharmaceutical Association was organized in February with twenty-five charter members. Drs. T. D. Rowe and K. L. Kaufman

are faculty advisors.—Beginning July 6, all schools will operate on a quarterly basis with two weeks vacation between each quarter.—A large decrease in freshman enrollment is anticipated.—A new practice drug store will be ready for use when the next session opens. The fixtures for the store have been donated by local druggists.—Dean Rudd was named on the Virginia Roll of Honor in the annual list published by the Richmond Times-Dispatch. Each year 12 to 15 outstanding persons in the state are selected for this honor.—Dean Rudd has also been made a member of the board of directors of the Virginia State Chamber of Commerce.

University of Michigan, College of Pharmacy.—Prof. C. H. Stocking has been appointed secretary of the College of Pharmacy to fill the vacancy created by the recent death of Prof. C. C. Glover.—Miss Aileen Grace has been appointed recorder of the College.—Recent elections to Alpha Chapter of Rho Chi include Ronald H. Chadwick, Paul E. Norris, Arthur A. Rosen, Ellen F. St. John, and Jack C. Wong.—Through an arrangement with the University Hospital, it is possible for students in the classes in manufacturing pharmacy to work several afternoons each week in the manufacturing laboratory of the hospital pharmacy.—The 11th annual pharmaceutical conference will be held May 19, 1942. Dr. Charles F. McKhann of the medical school will speak on "Recent Progress in the Study of Poliomyelitis" and Dr. Howard B. Lewis will speak on "Fertification and Enrichment of Foods and the National Health."

University of Minnesota, College of Pharmacy.—Dean Charles H. Rogers was the guest speaker at the banquet on April 16 concluding the Pharmaceutical Conference at the College of Pharmacy, University of Illinois.—Frank W. Bope and Grey Kornegay, graduate teaching assistants, were taken by the Selective Service in February and Laverne Small and Florence Schattensburg have been appointed to replace them.—Harry Stackhouse resigned as graduate teaching assistant in January and Edward A. Olson was appointed to succeed him.—The Sixth Pharmaceutical Institute held in February had a large attendance. A separate hospital pharmacy section was ably presided over by Mr. S. W. Morrison, Chief Pharmacist at the Illinois Research Hospital in Chicago.—Pharmacist William Janecek resigned in March to accept a position as a pharmaceutical chemist with the Goodrich-Gamble Company, pharmaceutical manufacturers of St. Paul. The position on the staff was filled by Stanley H. Nicholson, pharmacist of Rapid City, South Dakota, who is a graduate of the South Dakota State College of Pharmacy.—Dr. Charles V. Netz, as Past National President, attended the national convention of Phi Delta Chi Fraternity at the Stevens Hotel in Chicago on March 19-21. Dr. Netz also gave special lectures in March upon the chemistry of cosmetics to the sophomore class in home economics and to the class in textiles in the General college.

University of Montana, School of Pharmacy.—The entire Staff attended the district meeting at Spokane in March.—Dr. J. F. Suchy was elected vice satrop of Kappa Psi at the province meeting which was held on the same date.

University of Nebraska, College of Pharmacy.—Dr. Harald G. O. Holck and James R. Weeks attended the convention of the Federation of American Societies for Experimental Biology at Boston on April 1-5.

Other former Nebraskans in attendance were Dr. James M. Dille of the University of Washington; Dr. Edwin L. Smith of the University of Illinois; Dr. Robert H. Shuler of the University of Georgia; and Dr. Raymond S. Cunningham of Temple University. Dr. Dille was elected a member of the Nominating Committee of the American Society for Pharmacology and Experimental Therapeutics.—A grant has been made by the Ciba Company for continuation of the studies on the bioassay of digitalis.—Dr. J. B. Burt has been elected national president of the Rho Chi Society. He has also been elected by the University Senate to the Chancellor's Advisory Faculty Committee.—James R. Weeks and Howard P. Jensen, graduate students have been elected to membership in Phi Lamda Upsilon.—Maurice F. Blazier and Melvin R. Gibson have been elected to Associate membership to Sigma Xi. The annual joint Phi Beta Kappa and Sigma Xi lecture was held on April 13 with Prof. Lionel S. Marks, professor of mechanical engineering in the Graduate School of Engineering of Harvard University. He spoke on Recent Developments in the Production of Power.—Dr. J. B. Burt is the president of the Nebraska Chapter of Sigma Xi for the present year.

University of North Carolina, School of Pharmacy.—New initiates in Xi chapter of The Rho Chi Society are Mary Marsh Hood, Banks Dayton Kerr, and Stuart McGuire Sessoms.

Ohio State University, College of Pharmacy.—In line with the nation-wide program, a course in first aid was made available in the curriculum the past quarter under the direction of Dr. Duffy of the student health office. A considerable amount of new material over that required of the ordinary layman's class was introduced into the course. Thirty-seven seniors and two staff members registered for the course.—The student branch of the A. Ph. A. sponsored a lecture series during the winter quarter, directed the publication of a college publication which was distributed to the students, alumni, and allied A. Ph. A. student branches in other colleges, and participated in a program to stimulate interest in the forthcoming revisions of the U. S. P. and N. F.—To show their interest in pharmaceutical education, the Columbus Women's Pharmacy Club recently granted the sum of \$50 to be used in the purchasing of books or journals for the expansion of the facilities of the library for the use of the students.—In recognition of the benefits to be derived through the development of the graduate program in the College of Pharmacy, funds have been allotted by the Graduate School of the Ohio State Alumni Development Fund with which to purchase some fine pieces of research equipment.—The College of Pharmacy is sponsoring an open house on April 10th in connection with the annual High School Counsellor's day at the University. This marks the first time any college on this campus has participated in this way, and it is being received with much enthusiasm. Suitable publicity has been received from the publicity office, the local radio station has suggested plans for spot announcements and interviews over their station, and a program of interest to everyone is being worked out. The students are arranging displays of equipment and of their work in order to interest prospective students in the opportunities offered by a course in pharmacy. Invitations have been extended to the high school students, their counsellors, the University faculty, and to the general public to visit the display.—The Central Ohio Academy of Pharmacy has placed

Profs. Guth, Brown, and Christensen on their professional pharmacy committee, and Profs. Williams and Hiner on the general program committee to arrange for constructive and interesting programs the coming year.—In connection with the annual convention of the Ohio State Pharmaceutical Association the pharmacy staff will take charge of the professional pharmacy program. It will include talks on professional subjects by the staff members and a visit to the college laboratories.—The entire University will operate on the accelerated war time program beginning with the summer quarter. A full schedule of courses will be offered by the regular pharmacy staff, equal in every respect to those offered in the autumn quarter. Provision has also been made to accommodate those beginning students who wish to enter in September.—Dr. Ernest L. Beals has resigned from the staff of the department of pharmaceutical chemistry to accept a position in the research production department of the Burroughs Wellcome Company in New York. His college work will be taken over by Dr. Guth. Mr. W. Thomas Spain, a graduate student at Purdue has been added to the staff.

University of Oklahoma, School of Pharmacy.—The fifth annual school for retail druggists and sales personnel was held in the Student Union building February 3, 4 and 5. About 300 registrants attended. The program consisted of lectures by men engaged in various branches of the industry. The speakers at the annual dinner were President Joseph A. Brandt of the University and former President W. B. Bizzell. Included in the program was a clinic at the University pharmacy and a skit written by Dr. Bienfang and played by the pharmacy students. The talks have been printed and bound in book form and anyone interested can obtain a copy by writing to the Extension Division.—The ninth annual convention of the Oklahoma University Pharmaceutical Association was held in the Student Union on March 6. About 125 attended. Four sectional programs were held and various prizes for efficiency in scholarship were awarded and officers for the coming year were elected.—Dr. Ralph Bienfang was recently appointed by President Brandt to the Committee on Relations Activity. The committee represents the professional schools division of the newly-created University College. Dr. Lloyd Harris has been called into the Service. He holds a commission in the Chemical Warfare Division and at present is stationed at College Station, Texas.—Porter Stovall, Sam Wilson, and Robert Hood have recently been elected to Rho Chi.

Oregon State College, School of Pharmacy.—Enrollment at Oregon State College for the entire year shows a drop of 7.6 per cent for the first term as compared to the corresponding period of last year. Registration of men dropped eleven per cent and of women two per cent. The largest decreases were in the sophomore class and the graduate division. The School of Pharmacy was the only major school with an increase in registration which was twenty-two per cent over last year.—The fourth annual Biology Colloquium sponsored in the interest of science was held on Saturday, March 4. The theme was "The Biologist in a World at War." Dr. William Brodbeck Herms of the Division of Entomology and Parasitology, University of California, was leader.

Philadelphia College of Pharmacy and Science.—Dr. Horatio C. Wood was the speaker at the annual Founders' Day program February 23.—

In the first 120 years of its history this college has awarded 443 degrees to women which is 4.2 per cent of the total number of graduates.—President Griffith has been named vice president of the Association of Science Teachers of the Middle States.—The fourth annual seminar on modern pharmaceutical practice was held April 6 to 9. Three afternoons and one evening were devoted to instruction in first aid by a physician who is a certified Red Cross instructor. Lectures on pharmaceutical economics in war time, the pharmacist's part in war gas defense and the chemistry, pharmacy, and therapeutics of the new drugs of the Pharmacopoeia, which is soon to become official, were given by various members of the faculty.

Purdue University, School of Pharmacy.—Dean Glenn L. Jenkins has been elected a member of the Council of the American Pharmaceutical Association for the unexpired term of the late Dean C. B. Jordan, and Dr. C. O. Lee has been chosen second vice president of the Association for the year 1942-43.—The Annual Druggists' Business Conference was held on March 24 and 25.—A meeting of the student branches of District No. 4 of the American Pharmaceutical Association was held at Purdue on March 31 and April 1 with Dr. B. V. Christensen as the principal speaker.—Prof. Henry W. Heine, Director of the Pharmacy Extension Department, has been appointed Senior Planning Specialist on the War Production Board in Washington, D. C. His duty will be to help map out a broad program for civilian needs of drugs, medicines, toilet goods, cosmetics, and hospital and sanitary supplies of all kinds.

Rutgers University, New Jersey College of Pharmacy.—The present junior and senior classes have completed the standard first aid course and are now taking the advanced course for instructors. Also, about 50 pharmacists during the day time and an additional 40 during the evening are completing courses in first aid.—Private First Class John Nakonechny of the class of 1937 has been commended for particularly valuable and meritorious service rendered during recent army maneuvers.—Dr. Richard A. Deno is completing his second series of six lectures on nutrition and a third series will commence immediately. About 100 housewives have attended each series.—Prof. Russell E. Brillhart assisted by Mr. Martin Ulan is performing biological assays for the New Jersey State Department of Health, Division of Foods and Drugs.—Prof. George C. Schicks has been lecturing on war gases before defense councils in northern New Jersey and before other groups in New York City and the surrounding territory.

The University of Southern California, College of Pharmacy.—Many students and alumni have been attending Red Cross classes in first aid training and have obtained their certificates. A large group of the alumni have taken the advanced course in first aid and are now themselves acting as instructors in first aid groups.—The local section of the A.Ph.A. have planned a meeting with the junior section of the Los Angeles County Medical Association to be held during May. Frank Titus, Jr., who is now president of the Southern California Pharmaceutical Alumni Association, and James Thackray, professional pharmacist of Long Beach and a member of the American Pharmaceutical Association local board, are to be the speakers.—A twelve week summer school will be

opened giving courses which will be of most value to those students who are planning to take advantage of the speed-up program. Indications are that about fifty per cent of the students now registered in school will take advantage of this summer offer.—Many graduates are finding places in the Army and the Navy in which they are able to use their professional training in the active service of their country.

State College of Washington, School of Pharmacy.—Prof. Haakon Bang has returned to his post after having completed the requirements for the Ph. D. degree at Purdue University. He has been advanced to the rank of associate professor.—Miss Virginia Gilleland, a teaching fellow here, has been accepted for entrance to the University of Chicago Medical School, where she has also been awarded a fellowship in pharmacology.—S. B. Penick and Company have instituted a \$900 fellowship to be known as the S. B. Penick Fellowship in Pharmacy. It has been awarded to Morris Wolford.—Last year's five acre planting of belladonna is being expanded to more than ten acres.—On March 27 and 28 the annual joint conference of District No. 7, was held in Spokane. Important topics discussed were the means of securing more desirable recruits for the pharmaceutical profession, and the effects of accelerated pharmacy courses. The conference approved a list of 175 drugs to which the boards of the district will be restricted in their identification examinations.—On Saturday, March 28, Province XIV of Kappa Psi held a meeting at the Dessert Hotel in Spokane.—The annual drug show and open house has been cancelled this year because of war conditions.

University of Washington, College of Pharmacy.—Dr. Otto Loeuvi, research professor of Pharmacology at New York University, College of Medicine and Nobel Laureate in Medicine and Physiology, 1926, is the Walker-Ames visiting Professor of Pharmacology and Physiology for the spring quarter of the current year. The program includes a series of seminars on the following subjects: Recent Advances in the Field of Pharmacology and Physiology; The Point of Attack of Autonomic Drugs; Specific Sensitivity and Hypersensitivity of Denervated Organs; On the Action of Ketions; Problems Connected with the Chemical Transmission of the Nervous Impulse; On Blood-Sugar Regulation; and Questions Related to Hormone Action. Five public lectures of a more general nature are also being given. The subjects are: General Aspects of Pharmacology and Physiology; Story of Chemical Medication of Nervous Activity; Drug Action and Drug Discovery; Adaptation and Regulation Within the Organism; and The Organism as a Unit.

Western Reserve University, School of Pharmacy.—John W. Boenigk, A. M., 1942, has accepted an assistantship in pharmaceutical chemistry at Purdue.—Dr. M. S. Trupp spoke recently before the Lincoln High School on "Opportunities Available to the Pharmacist," as a part of the program to enable students to choose their vocations.—Dean Davy was chairman of the committee which made arrangements for the United States Pharmacopoeial Convention which reconvened at Cleveland on April 7.—Miss Nellie Watts attended the annual meeting of the Federation of American Society of Experimental Biology at Boston, March 31.—Dr. F. J. Bacon gave a paper on "Pharmaceutical Alkaloids and Extracts" before the eighth annual Chemurgic Conference at Chicago on March 25.

Miscellaneous Items of Interest

A Memorial

CLIFFORD CONKLIN GLOVER

With the passing of Clifford Conklin Glover, loyal and unselfish member of the faculty of the College of Pharmacy of the University of Michigan, the students of the College lost a true friend and wise counselor, the University, an able teacher, and the city of Ann Arbor, a good citizen. He had been in ill health for several weeks and was confined to his home at the time of his death, which occurred on January 31, 1942.

Professor Glover was born in Jackson, Michigan, January 16, 1888, later moving with his parents to Manchester where he attended the public school and the high school, from which he was graduated in June, 1907. He received the degree of Pharmaceutical Chemist from the College of Pharmacy of the University of Michigan in June, 1912, the degree of Bachelor of Science in 1913, and Master of Science in 1914. He spent the year 1921-22 in botanical research in Columbia University. His ability as a teacher was recognized early in his career and he was appointed Teaching Assistant in Pharmacy in 1913, Instructor in 1914, Assistant Professor in 1919, Associate Professor of Pharmacognosy in 1921, and Professor of Pharmacognosy in 1931. He served as Acting Secretary of the College of Pharmacy from 1917 to 1919, and since 1919 had held the title of Secretary of the College.

His interest in high scholastic standards was evidenced by the fact that his name was listed on the membership rolls of a number of honor societies. He became a charter member of the University of Michigan Chapter of Phi Kappa Phi when that organization was established on the campus in 1926, and served as a member of the Executive Committee in 1928-29 and was re-elected in 1938. He was a charter member of Alpha Chapter of Rho Chi, national pharmaceutical honor society, and was chapter president at the time of his death. He also held membership in Phi Lambda Upsilon, national chemical honorary society, the American Association for the Advancement of Science, the American Chemical Society, the American Pharmaceutical Association, the Michigan Academy of Science, and Phi Delta Chi, pharmaceutical fraternity. He was an active participant in the work of the American Association of Colleges of Pharmacy and had served on numerous committees of this organization.

Professor Glover was a lover of nature and spent his summers with his family at their cottage on Pleasant Lake near Manchester. Here he experimented with flowers and shrubs and worked in stone and mortar. Two fireplaces in the cottage and an outdoor one for roasting steaks for his family and their many friends were the result of his handiwork. If there was something that needed building, he was always equal to the task. He was an active member and a past president of the Ann Arbor Kiwanis Club. Wherever and whenever this organization was to be found carrying out its program for the aid of under-privileged children, "Cliff" was present doing his part. He was deeply interested

in the work of the Ann Arbor Humane Society and was a member of its Board of Directors. His cheerful disposition and his appreciation of all the activities of the community won for him friends in all walks of life.

Professor Glover was actively devoted to the various phases of the work of the Ann Arbor Congregational Church, of which he had been a member for many years. He served an eight-year term as Deacon and had been chairman of various committees concerned with the activities of the church.

On July the 30th, 1913, he married Julia A. Landwehr, of Manchester. Two daughters, Mary, 17, and Janet, 15, are students in the Ann Arbor High School.

Charles H. Stocking

Tentative Program

The American Association of Colleges of Pharmacy

Forty-third Annual Meeting, Denver

President, R. A. Kuever; Vice-President, P. A. Foote; Secretary-Treasurer, Zada M. Cooper; Chairman, Charles H. Rogers.

SUNDAY, AUGUST 16

8:00 P. M. Meeting of the Executive Committee.

MONDAY, AUGUST 17

9:00 A. M. Meeting of the Executive Committee.

9:30 A. M. Conferences of Teachers.

1:30 P. M. First Session.

6:00 P. M. Annual Dinner.

8:00 P. M. Second Session.

TUESDAY, AUGUST 18

8:00 P. M. Third Session.

9:30 A. M. Joint Session of the American Pharmaceutical Association, the American Association of Colleges of Pharmacy, and the National Association of Boards of Pharmacy.

Conference of Teachers of Pharmacy

Chairman, Earl P. Guth; Vice-Chairman, Louis W. Busse; Secretary, John F. McCloskey.

MONDAY, AUGUST 17, 9:30 A. M.
(Program to be supplied)

Conference of Teachers of Chemistry

Chairman, George P. Hargreaves; Vice-Chairman, Lloyd M. Parks; Secretary, Arthur E. James.

MONDAY, AUGUST 17, 9:30 A. M.
(Program to be supplied)

Conference of Teachers of Pharmacognosy and Pharmacology
Chairman, A. John Schwarz; Vice-Chairman, Robert L. McMurray; Secretary, Lloyd W. Hazleton.

MONDAY, AUGUST 17, 9:30 A. M.
(Program to be supplied)

Conference of Teachers of Pharmaceutical Economics
Chairman, Lawrence F. Ferring; Joseph H. Goodness.
(Program to be supplied)

Sessions of the Association

FIRST SESSION, MONDAY, AUGUST 17, 1:30 P. M.

1. Roll Call.
2. Appointment of Committee on Resolutions.
3. Appointment of Nominating Committee.
4. Appointment of Auditing Committee.
5. Address of the President, R. A. Kuever.
6. Report of the Secretary-Treasurer, Zada M. Cooper.
7. Report of the Executive Committee, Charles H. Rogers.
8. Reports of Standing Committees.
 - (1) Committee on Educational and Membership Standards, L. David Hiner.
 - (2) Committee on Teaching Methods, George L. Webster.
 - (3) Committee on Activities for Alumni, Charles W. Bauer.
 - (4) Delegates to the American Council on Education, Rufus A. Lyman.

MONDAY, AUGUST 17, 6:00 P. M.

Joint Annual Dinner with the N. A. B. P.
Address,

SECOND SESSION, MONDAY, AUGUST 17, 8:00 P. M.

1. Reports of Standing Committees, Continued
 - (1) Committee on Relation of Boards and Colleges, Howard C. Newton.
 - (2) Committee on Libraries, Charles O. Lee.
 - (3) Committee on Problems and Plans, Rufus A. Lyman.
2. Report of the Editor of the American Journal of Pharmaceutical Education, Rufus A. Lyman.
3. Report on American Foundation for Pharmaceutical Education, Ernest Little.
4. Presentation of Recommendations from the Conference of Teachers.

THIRD SESSION, TUESDAY, AUGUST 18, 2:00 P. M.

1. Reports of Special Committees
 - (1) Committee on Predictive and Achievement Tests, A. B. Lemon.
 - (2) Committee on Informative Literature, B. V. Christensen.
 - (3) Committee on Scholarship, H. Evert Kendig.
 - (4) Committee to Revise Constitution and By-Laws, A. G. DuMez.

2. Report of Historian, George Urdang.
3. Report of the Committee on Resolutions.
4. Report of the Auditing Committee.
5. Miscellaneous Business.
6. Election of Officers.
7. New Business.
8. Executive Session.

Joint Session of the American Pharmaceutical Association,
the American Association of Colleges of Pharmacy and
the National Association of Boards of Pharmacy.

TUESDAY, AUGUST 18, 9:30 A. M.

1. Report of the Fairchild Scholarship Committee, E. G. Eberle.
2. Report of the Pharmaceutical Syllabus Committee, Henry M. Burlage.
3. Report of the Committee on Status of Pharmacists in the Government Service, H. Evert Kendig.
4. Report of the American Council on Pharmaceutical Education, A. G. DuMez.
5. Report of the Committee on Legislative Policy (?)
6. Report of Committee on Personnel Problems, Joseph B. Burt.
7. Report of Committee on Professional Relations:
 - (a) College Activities, George C. Schicks.
 - (b) State Activities, Charles H. Evans.
8. Report of Committee on Dental Pharmacy, George C. Schicks.

Second Seminar of the American Institute of the History of Pharmacy

To Be Held at Purdue University, School of Pharmacy,
July 27 and 28, 1942.

The American Institute of the History of Pharmacy invites all members of the faculties of the schools of pharmacy and all graduate students interested in the history of pharmacy and its teaching to join its second Seminar.

While the first Seminar, held at the University of Wisconsin School of Pharmacy on July 28 and 29, 1941, was primarily devoted to the clarification and discussion of the general principles of the history of Pharmacy and its teaching, the second Seminar will deal with special topics and problems.

The beginning in methodology of teaching history of pharmacy made in 1941 will be continued in the lectures devoted to pharmacy in antiquity. In the other parts of the program advantage has been taken of the presence of lecturers especially versed in the fields that they are presenting and representing. The outlines for History, Literature and Ethics of Pharmacy in the Pharmaceutical Syllabus will be submitted to a discussion. Finally the bicentennial of C. W. Scheele's birth will be honored. The detailed program follows:

Monday, July 27

- 9:00 A. M. Registration
 10:00 A. M. Address of Welcome.....Dean Glenn L. Jenkins
 10:20 A. M. The Teaching of History of Pharmacy in our Colleges of
 Pharmacy.....Professor C. O. Lee
 11:00 A. M. Discussion of the Outlines for History, Literature and
 Ethics of Pharmacy in the Pharmaceutical Syllabus
Rufus A. Lyman

Luncheon

- 1:30 P. M. Mexico's Contributions to American Pharmacy
Miss Bertha Baron
 2:00 P. M. Pharmacy in Ancient Babylon, Assyria, Palestine
 and Egypt.....Dr. George Urdang
 3:00 P. M. Contributions of Early Botanists to Pharmaceutical
 Knowledge.....Dr. C. L. Porter
 4:00 P. M. Discussion
 6:00 P. M. Subscription dinner
 7:00 P. M. The Place of the Scientific Techniques in the General
 History of Culture.....Dr. Louis M. Sears

Tuesday, July 28

- 9:00 A. M. Pharmacy in Ancient Greece.....Dr. George Urdang
 9:45 A. M. History of the Louisville College of Pharmacy
Dean G. L. Curry and Professor F. D. Stoll
 10:30 A. M. Why Study the History of One's Profession?
Dr. W. E. Howland
 11:30 A. M. Scheele, The Noted Apothecary.....Dr. George Urdang
 12:30 P. M. Luncheon
 1:30 P. M. The American Pharmaceutical Association and Its
 History.....Dean B. V. Christensen
 2:15 P. M. The Debt of Chemistry to Pharmacy.....Dr. P. J. Elving
 3:00 P. M. The Role of Biographical Studies in Teaching the
 History of Pharmacy.....Dr. C. J. Zufall
 4:00 P. M. Discussion
 4:30 P. M. Adjournment

Inquiries should be directed to Professor C. O. Lee, Purdue University,
 Lafayette, Ind.

George Urdang,
 Director of the A. I. H. P.

The Cleveland Meetings

In my opinion, little of benefit to pharmacy will come from the Cleveland Pharmaceutical-Medical meeting of April 6. Its results may even be somewhat negative. I doubt if there will be any considerable increase in good will on the part of either group. The conference led to no worth while action. Possibly it could not, but my impression at

the time was that action was studiously avoided. Pharmacy talked. Medicine listened, and perhaps smiled.

I do not agree with—in fact I am unalterably opposed—to some of the ideas expressed by pharmacists during the discussion. Pharmacy may well learn from the experiences of others, but it should **not** look to medicine for leadership. Instead of pleading for such direction, pharmacy should be alert to oppose it. Not so long ago medicine found it necessary to put its own house in order. It did not seek outside leadership. Neither should pharmacy. If the pharmacists of America lack the intelligence necessary to solve their own problems, if they are unable to find competent leadership in their own group, if they cannot develop and progress without having others lead them, then pharmacy does not deserve, nor should it expect to continue to receive, the legal protection it now enjoys as an important and independent branch of the medical profession.

Hugh C. Muldoon
Duquesne University

You ask for a frank statement of my impressions of the recent meetings in Cleveland. Here it is.

Two nights on the train and two days away from the office at a time when office duties are pressing—two meetings which promised no news or excitement, and lived up to their promise,—yet, paradoxically, I feel sure the meetings were worthwhile and the time used in attending them was well spent.

It was evident very soon after the opening of the Conference on Medical-Pharmaceutical Relations on Monday afternoon that the participants in this meeting were operating "under wraps." Platitudes were expressed with deep conviction; the dignity of both pharmacy and medicine was a matter of great concern. Dr. Torald Sollmann presided with appropriate dignity and diplomacy, courteously warding off any motions which might later prove embarrassing to the American Medical Association. It was interesting and even entertaining, if one were in the right mood.

Probably orchids should be presented to all who took part in this meeting but, in my opinion, larger ones should be awarded to Dean Robert C. Wilson and Dean Wortley F. Rudd,—to the former for his excellent presentation of his formal address and to the latter for his sincere attempt to insure a measure of permanence to the cooperation of the two professions as expressed during this afternoon.

Dr. Morris Fishbein was the principal speaker at the dinner Monday evening. His address, "The Status of Medicine and Pharmacy in the War and After," was delivered in the manner which we expect of him and which few, if any others can equal. We now know where Medicine and Pharmacy stand in the picture. Or, do we?

The meeting of the U. S. Pharmacopoeial Convention was more or less routine, as anticipated, with the discussions largely on topics expected in a classroom of Freshman English. Dr. Fishbein frequently was playing the part of teacher! Seldom does a meeting have as skilful a presiding officer as we had here. It is a pleasure to attend a meeting at which Dr. Cary Eggleston presides, even when the matters which come before it are routine.

In conclusion, Dr. Lyman, many of us who attended these meetings feel we learned the answers to many questions which are important in our plans for pharmacy. But, I doubt if these answers will be apparent to one who merely reads a copy of the proceedings of these meetings.

Howard C. Newton
Massachusetts College of Pharmacy

Your letter of April 11 asking me to give you my impressions of the conference of physicians and pharmacists which was held in Cleveland arrived this morning. I am glad to do as you suggest on the basis that you are willing to accept a dictated rather than a carefully thought out reply.

I doubt if the conference accomplished all that any of us hoped that it might. In a sense, I suppose that is fortunate, otherwise there would be no need for future conferences. I know that some of the men in attendance were disappointed that the meeting did not culminate in a set of very definite and directive resolutions. On the other hand, it was agreed that medical and pharmaceutical publications should give wide publicity to the meeting, and it was also agreed that state medical and pharmaceutical associations should do whatever they found possible in bringing reports of the conference to the attention of their members. Publicity of that sort will prove most helpful and will certainly help to pave the way for the next conference, which I confidently believe will be held.

Possibly I was expecting too little, but it does seem to me that the first conference was a very definite success, that much was accomplished, possibly as much as we had any right to hope for.

Ernest Little
Rutgers University

The Policy of the American Council on Pharmaceutical Education with Regard to the Acceleration of the Course in Pharmacy for the Duration of the War Emergency

The American Council on Pharmaceutical Education, recognizing that adjustments in the educational programs of all institutions of higher education may have to be made as a result of the present war emergency, and believing that such adjustments in the program of pharmaceutical education as may become necessary can be made without endangering present standards, adopted the following statement of policy at a meeting held on March 27, 1942:

1. It is recommended that the colleges of pharmacy give serious consideration at this time to the acceleration of their respective programs for the education of pharmacy students in order that the

armed forces of the country, as well as the civilian population, may be adequately served.

2. The final decision as to whether or not an accelerated program shall be adopted, is believed to be a matter which should be left with the individual colleges.

3. In the event that an accelerated program is adopted, the Council will permit the following deviations from its standards for the period of the war emergency:

(a) Section VIII, 1 (a)—“At least two months must elapse between each college year.”

This requirement is suspended for the duration of the emergency.

(b) Section VIII, 6 (a)—The degree of Bachelor of Science, (B.S.), or Bachelor of Science in Pharmacy, (B.S. in Phar.), and these degrees only, may be given for the completion of the four-year course of not less than 3200 hours.”

This requirement is amended for the duration of the emergency to permit the granting of full credit to students ordered to report for induction into the armed services, who have completed more than half of the work of any semester or quarter and who have successfully passed such tests as may be given to establish full credit. This amendment does not apply to the freshman year.

4. The accreditation of a college of pharmacy will be withdrawn if there is any perceptible lowering of educational standards (including requirements for admission), either in the scope of the curriculum, total number of hours required for graduation or the level of scholarship demanded, except as this may be affected by the foregoing amendment to Section VIII, 6 (a) of the Council's Standards for Accreditation.

A. G. DuMez,
Secretary-Treasurer

Placement Service

The Placement Service is for those who care to use it whether seeking a scholarship, fellowship, assistantship, or instructorship. Key numbers will be used and names and addresses of applicants will be furnished on application to the Editor.

1. Senior pharmacy student at Washington State College. Age 20. Wishes to do graduate work in pharmaceutical chemistry and pharmacology.
2. Advanced senior at Ohio State University with a preference for pharmacology and pharmacognosy. B plus scholastic average, active in student activities, and president of the A. Ph. A. Student Branch. Interested in teaching as a profession.
3. Senior, Ohio State University, College of Pharmacy, with a preference for the field of pharmacy or pharmaceutical chemistry. B plus scholastic average. Research minded.
4. Senior, age 21, single, Protestant. B. S., in Pharmacy from Ohio Northern University, June, 1942. Desires assistantship in pharmacognosy or pharmacology.

5. Senior, age 20, single, Protestant. B. S., in Pharmacy from Ohio Northern University, June, 1942. Desires assistantship in pharmaceutical chemistry or pharmacology.
6. Age 21, B. S., in Pharmacy expected June, 1942, University of Colorado. Wishes to enter graduate work in pharmacology. Have worked as an assistant pharmacist during summer months and part-time while in school.
7. Age 21. Married, B. S., in Pharmacy, expected June, 1942. Interested in graduate work in bacteriology and pharmacy. Six months experience in drug store in Wyoming.
8. Senior, B. Sc., in June, 1942, University of Connecticut, wished to major in Pharmacy.
9. Graduate of University of Southern California, College of Pharmacy. Will receive Master's degree in January. Wishes scholarship immediately as candidate for Doctor's degree in pharmaceutical chemistry. At present employed as instructor, part time basis. High grade average, interested in teaching and research.
10. Senior, School of Pharmacy, University of North Carolina, Age 24, married, and has Rho Chi average. Wishes major only in pharmaceutical chemistry with a minor in pharmacy or pharmacology.
11. Senior, School of Pharmacy, University of North Carolina, single, wishes to do graduate work in pharmaceutical chemistry as a major.
12. Completing requirements for Master's degree, June, 1942, School of Pharmacy, Western Reserve University. Single. Age 24. Desires assistantship in pharmaceutical chemistry. Interested in teaching. Has had two years experience as assistant in pharmaceutical chemistry and operative and manufacturing pharmacy.
13. Address at Ohio State University, College of Pharmacy. Holds the B. S. degree from Rutgers University, College of Pharmacy, course work will be completed in summer session of 1942. Desires either an assistantship for continuing graduate work, or a teaching position in Pharmacy.

State Association Secretaries Meeting

Suggested by former president Charles Hall Evans, a meeting of secretaries and other officers of state pharmaceutical associations with officials of the A. Ph. A., the N. A. B. P., and the A. A. C. P., was held at the American Institute of Pharmacy in Washington on February 20 and 21. The program was developed by E. F. Kelly, secretary of the A. Ph. A. after conferences with B. V. Christensen, President; Robert P. Fischelis, Chairman of the Council, and with Jennings Murphy, Chairman of the Conference of Pharmaceutical Association Secretaries.

The speakers were officials of state associations and the government. The theme of the meeting, as keynoted by President Christensen, was to determine how pharmacy can best serve the country during the emergency and how to mobilize the pharmaceutical facilities and personnel to provide effective service. The highlights of the meeting are given in the following paragraphs.

H. Evert Kendig, Chairman of the Committee on the Status of Pharmacists in the Government Service, presented data on the number of pharmacists and the number of drug stores in the United States and the number of students in the schools of pharmacy which had been prepared for Selective Service Headquarters. On the basis of this data he concluded that it would be advisable for local draft boards to determine the availability of pharmacists with the assistance and advice of a committee to be set up by each state association.

Brig. General Lewis B. Hershey, Director of the Selective Service System, speaking to the Conference explained Washington Headquarters policies and the mechanics of conscripting men.

Major Siegfried Coblentz, Occupational Adviser of the Selective Service System, in discussing plans stated that local draft boards want guidance on the public need of pharmaceutical service. He proposed that an Advisory Committee be created by each State Pharmaceutical Association to operate at the administrative level in cooperation with the occupational advisers to the State Directors. The meeting unanimously adopted the proposed plan.

Brig. General Larry B. McAfee, Assistant to the Surgeon General of the United States Army, described the service of pharmacists in the Army. Pharmacists, he said, must know the rudiments of military science and maneuvers. From the Tables of Organization it is possible to predict that 5000 men will be necessary to perform pharmaceutical service in the Army of 3,600,000 men to be developed during the current year. The greater share of this number the Army expects to get from Selective Service. According to General McAfee a sincere effort will be made to utilize all pharmacists in their professional capacity.

In explaining how pharmacists may become commissioned, General McAfee stated that the individual is given a physical examination and is sent to a reception center where he is inducted and assigned to a branch of service for which he is best fitted. A pharmacist is sent to one of the four medical replacement centers, Camp Lee, Camp Grant, Camp Robinson or Camp Barkley for 13 weeks. There he receives basic military training and is judged with respect to his ability as an officer. At the close of the 13 weeks he may apply for Officer Training School. A special board of review decides whether or not he is officer material. If he qualifies he is sent to Officer Training School at Carlyle. Failing to be so recommended the pharmacist will be reported to the Adjutant General as having qualified to be used to fill pharmaceutical vacancies.

Dr. George Baehr, Chief Medical Officer of the U. S. Office of Civilian Defense, in speaking to the meeting urged pharmacists to follow the program developed by the A. Ph. A. in collaboration with the U. S. Office of Civilian Defense. The Conference approved the plan in full and recommended its adoption in all states as soon as possible.

R. A. Kuever, President of the A. A. C. P., addressed the meeting and explained that colleges of pharmacy are studying the question of course acceleration. He pointed out the financial problem which acceleration would present to the college as well as the student and that no definite plans can be made until such factors have been fully considered. The Conference wholeheartedly endorsed the efforts of the A. A. C. P. to solve this problem and pledged its support in the development of the program.

The Office of Price Administration was represented by Frank A. Delgado, Chief of the Drug Unit. He explained the work of fixing price ceilings on raw materials used in the production of pharmaceutical products.

Robert P. Fischelis, Chief of the Medical and Health Supplies Section, Division of Civilian Supply, of the War Production Board, described the work of his organization which consists of making it possible for the American people to get along without those materials which are either unobtainable or which the country cannot spare. He expressed the opinion that now as never before the pharmacist must consider himself the purchasing agent of his community in the matters of medicines; he must buy wisely so that consumers may buy wisely.

Kenneth Tator, Chemical Consultant, Conservation and Substitution Branch, Bureau of Industrial Conservation of the War Production Board, described the part pharmacists may play in conserving supplies. He said: (1) Do not over-wrap packages; (2) Do not dispense more medicines than the patient needs; (3) Reduce inventories; (4) Encourage the sale of large sized, frequently used products; (5) Salvage waste; (6) Study the possibility of using non-critical material in place of those on which there is a shortage.

Dr. E. R. Coffey, Assistant Surgeon General of the U. S. Public Health Service, urged pharmacists to combat carelessness and neglect to the limit of their abilities. Window displays, the distribution of health educational material and advice to customers about local health service were suggested as helpful. He stated that "persons with the training of pharmacists are in a position to be of great service as members of boards of health or advisory health committees."

A. G. Murray, Senior Chemist of the Federal Food and Drug Administration, discussed various phases of enforcement affecting pharmacists, especially those sections dealing with the distribution of dangerous drugs. Attention was called to the Administration's suggestions that dangerous drugs be limited to prescriptions and that the physician should take the responsibility with respect to refills. Improper distribution of dangerous drugs by physicians and their office help was said to be a problem for control under state laws.

The Conference adjourned after adopting "thank you" resolutions to the speakers and especially to the A. Ph. A., its president, its secretary and all the members of its staff.

Rudolph A. Kuever.

Report of the Delegate to the National Drug Trade Conference, December 19, 1941

The regular annual meeting of the National Drug Trade Conference was held at the Washington Hotel, Washington, D. C., on December 10, 1941, President Carson P. Frailey presiding. The meeting opened at 9:30 a. m. and was adjourned at 5 p. m.

Because of the crisis brought on by the declaration of war against Japan, the attendance was unusually small. The following delegates

were present: A. G. DuMez and Ernest Little, representing the American Association of Colleges of Pharmacy; Leslie D. Harrop, S. B. Penick, Sr., Carson P. Frailey, representing the American Drug Manufacturers' Association; E. F. Kelly, George D. Beal and R. P. Fischelis, representing the American Pharmaceutical Association; Harry Noonan, Clarence W. Warner and S. W. Fraser, representing the American Pharmaceutical Manufacturers' Association; A. C. Taylor, P. H. Costello and R. L. Swain, representing the National Association of Boards of Pharmacy; E. L. Newcomb and Frank R. Graham, representing the National Wholesale Druggists' Association; Ray C. Schlotterer, H. M. Bradbury and John A. Crozier, representing the Federal Wholesale Druggists' Association; Theodore Christianson and Rowland Jones, Jr., representing the National Association of Retail Druggists; James F. Hoge, S. T. Helms and F. J. Cullen, representing the Proprietary Association of America. The privileges of the floor were granted to Messrs. Stephens Rippey, Hugh Craig, Wallace Werble, H. Evert Kendig, James J. Flanagan and Robert W. Rodman.

In addition to the reports of standing committees, your delegate read a paper on "The Trends in Pharmaceutical Education"; Dean H. Evert Kendig gave a report on the status of pharmacists in the Government service and pharmacy's position in the program for civilian defense was discussed. However, the principal item of business taken up by the Conference was the report of the Committee on Endowment, read by Chairman Ernest Little.

In his report, Chairman Little presented a constitution, certificate of incorporation and by-laws for The American Foundation for Pharmaceutical Education. Each of these items was discussed and a number of suggestions for changes were made.

Following the discussion of Dean Kendig's report on the status of pharmacists in the Government service, a motion was passed approving the Pharmacy Corps Bill and urging the members of the conference to do everything within their power to promote its passage.

The views of the Conference with respect to these and other items of business are expressed in the following five resolutions which were adopted:

RESOLUTIONS

- I. WHEREAS, The maintenance of public health and the health of the armed forces of the United States is of the highest importance as a direct war measure, and
WHEREAS, The continued availability of all necessary medicinal preparations is of vital importance to such effort, now therefore
BE IT RESOLVED, That the National Drug Trade Conference does hereby pledge its whole-hearted and continued, full and energetic use of all facilities of our profession and industry to provide these essential medicinals, to the end that final and complete victory shall be achieved.
- II. WHEREAS, In the past year a number of states have amended their narcotic laws to restrict sale of exempt preparations, and
WHEREAS, To protect the legitimate use and sale of exempt narcotic preparations from abuse, to conserve crude opium supplies and to assure adequate safeguards to public health, it appears

advisable to further restrict general sale and use of certain exempt narcotic preparations, and

WHEREAS, it is deemed highly desirable to restore uniformity between state and federal narcotic laws, now, therefore,

BE IT RESOLVED, That the National Drug Trade Conference does hereby approve, endorse and urge the adoption of amendments to the federal and the several state narcotic acts to limit exempt narcotic preparations to those containing not more than one grain of codeine or any of its salts per fluid ounce, or one-quarter grain ethylmorphine or any of its salts per fluid ounce, or if a solid or semisolid preparation per avoirdupois ounce, and to Brown's Mixture, Stoke's Expectorant, and Lead and Opium Wash.

- III. BE IT RESOLVED That the National Drug Trade Conference do everything lawfully within its power to discourage and prevent the misuse of the so-called "physician's samples."
- IV. BE IT RESOLVED, That the National Drug Trade Conference advocate the formation of an American Foundation for Pharmaceutical Education substantially along the lines recommended in the report of its Committee on Endowment, and that it urge its constituent members to assist in the formation of such a Foundation, giving due consideration to the various criticisms and suggestions which were discussed at today's meeting.
- V. WHEREAS, Ethyl Alcohol is a necessary and indispensable ingredient either as a solvent or as a preservative, or both, of many important drugs, medicines and medical supplies, therefore be it RESOLVED, That the National Drug Trade Conference urges the Federal and State Governments to remove any excise tax from ethyl alcohol used in bona fide medicinal substances with such safeguards and penalties against abuse as may be necessary, in order that the cost of these substances to the sick may be more reasonable.

The following officers were elected to serve for the coming year:

President—Carson P. Frailey, Jr.

Vice-President—Harry Noonan

Secretary-Treasurer—Rowland Jones, Jr.

Executive Committee:

A. G. DuMez, representing the American Association of Colleges of Pharmacy

Carson P. Frailey representing the American Drug Manufacturers' Association

R. P. Fischelis, representing the American Pharmaceutical Association

Harry Noonan, representing the American Pharmaceutical Manufacturers' Association

Ray Schlotterer, representing the Federal Wholesale Druggists' Association

A. C. Taylor, representing the National Association of Boards of Pharmacy

E. L. Newcomb, representing the National Wholesale Druggists' Association

Rowland Jones, Jr., representing the National Association of
Retail Druggists

F. J. Cullen, representing the Proprietary Association.

A. G. DuMez, Delegate, A.A.C.P.



This bronze tablet bearing a portrait of the late beloved Dean Laird J. Stabler, has been mounted on the wall inside the entrance to the Pharmacy Building at the University of Southern California. Standing at the left is Dean Alva Hall and to the right, Harold Miller, 1940-41 president of the Alumni Association. The plaque was the gift of the Association.

New Books

Position of Pharmacy in Sickness Insurance—by George Urdang, Director of the American Institute of the History of Pharmacy, and Jennings Murphy, Secretary of the Wisconsin Pharmaceutical Association. A brochure of 24 pages, the publication of which was made possible by the Wisconsin Pharmaceutical Association. American Institute of the History of Pharmacy. Madison, Wisconsin. 1942.

The study, the result of which is set forth in this brochure was made at the request of the Executive Committee of the Wisconsin Pharmaceutical Association. The secretary of that Association, Jennings Murphy, has since 1937 made an extensive study of the position of pharmacy in sickness insurance and has gathered much material concerning the workings of socialized medicine which is of the greatest importance to the practicing pharmacist. Dr. Urdang has taken this material and out of his long experience and intimate contacts through several decades with European pharmacy, where socialized medicine has been developed to a high degree, has written this brochure giving the material that will be of the highest actual and practical importance to the retail pharmacist when the problem of sickness insurance should become acute in this country. There is no question but that we are standing on the brink of that stage right now and it will become of greater importance during the post war reconstruction period. It, therefore, behooves us to become acquainted with the practices and experiences of other countries with this, one of the greatest of all social problems and in importance, second to none unless it be education and religion. This brochure gives the information in a clear cut way that the pharmacist needs in understanding the problems pertaining to sickness insurance. It represents the sixth study that has been published during the first business year of the American Institute of the History of Pharmacy. The other studies which may be obtained by addressing The Director of the Institute at the University of Wisconsin at Madison are:

1. A brochure setting forth the facilities for pharmaceutico-historical work at Madison, Wisconsin.
2. Mimeographed proceedings of the organizational meeting at Madison, Wisconsin.
3. Mimeographed proceedings of the first annual meeting held at Detroit.
4. A mimeographed report on the first Seminar of the A.I.H.P. held at Wisconsin including the lectures delivered on this occasion (in total about 100 pages).
5. A picture concerning the mentioning of the apothecary's art in the Bible (on Christmas).
6. A reprint of a paper published in the *Am. Journ. Pharm. Ed.* (January 1942) dealing with "Pharmaceutical Education from the Historical Point of View."

R. A. L.

The 1941 Year Book of General Therapeutics—by Oscar W. Bethea, Ph. M., M. D., F.A.C.P., Prof. of Clinical Medicine, Tulane University, School of Medicine; Senior in Medicine, Southern Baptist Hospital; Senior Visiting Physician, Charity Hospital; member of the Revision Committee of the U.S.P., 1930-40; author of "Clinical Medicine" and *Materia Medica, Drug Administration and Prescription Writing.* 1942. 520 pages. 77 illustrations. The Year Books Publishers. Price, \$3.00.

The 1941 Year Book measures up to the usual standard of this publication which means that the latest knowledge and practices in the field are stated clearly, briefly and in a usable form. The drugs and techniques which are of the greatest interest are features in the book. They cover the sulfonamides, the vitamins, the hormones, the synthetics, the methods of transfusion and infusion, and the making of the induction of anesthesia safer. The subject of therapeutics, while of great importance to the practitioner, is of just as great importance to the fields of physiology and pharmacology and pharmacy and no pharmacy library should be without the Year Book of General Therapeutics.

R. A. L.

A Manual of Pharmacology,—by Torald Sollmann, M.D., Professor of Pharmacology and *Materia Medica* in the School of Medicine of Western Reserve University, Cleveland. Sixth edition, entirely reset, 1942. 1298 pages. W. B. Saunders Company. Price \$8.75.

The new Sollmann has retained the main features which have found favor with many teachers in pharmacology, namely to have a rather concise running story of such features in ordinary print, relegating the critical description of the experiments upon which this story is built to sections in smaller type, in themselves valuable adjuncts to the discussion of laboratory experiments by the students. Also, at the beginning of each chapter there is an introduction giving in terse language the general features of the action and importance of the drug or group in question, a most valuable paragraph for review purposes. It must suffice to say that all the major advances of recent years have been included, not merely by adding to the discussions of previous drugs and by adding the more important new remedies in such fields as vitamins, local anesthetics, and so on, but by adding entirely new chapters, as in case of the sulfonamide compounds, the glycols and the adrenal cortex. To keep the book approximately the size of the former edition, it was necessary to include only preparations of major importance, to shorten discussions of certain older materials or even to delete them—as in case of the section on specific sera and vaccines—and, finally, to include a selected bibliography covering only the past twenty years. The new edition has been entirely reset; considering the size of such a book, the proof-reading has been excellent. Also, the new binding appears to be both attractive and sturdy; the latter is important, because, undoubtedly, this text will be subject to frequent use both by teachers and students in this and associated fields, as well as by many physicians who wish to keep up with the rapid advances made in pharmacology in recent years. It is naturally of interest that adequate reference has been made to pharmacological research carried out in the pharmacy colleges. The only criticism we wish to make is that in the extensive discussion of the relation of alcohol to automobile driving, an unfortunate error has crept in on page 700

where the critical concentration of alcohol in the blood is given as 1.5 per cent instead of per thousand. In spite of the appearance of several new pharmacology texts during the past few years, we feel certain that the new edition of Sollmann's Manual will get its usual wide distribution.

H. G. O. H.

The Medicinal Plant Garden, State University of Iowa.—Last year, through cooperation with the Department of Botany, the College of Pharmacy started a new medicinal plant garden on the west campus directly south and west of the new University greenhouses.

The increasing difficulty of obtaining important vegetable drugs made it necessary to use several of the formal plots for the growing of needed plants. For example one thousand *Belladonna* plants were cultivated. The leaves collected and assayed are employed for the making of tincture and other belladonna products which are used at the University Hospital. The seeds were collected to insure an adequate crop for the future. Ten thousand seedlings are nearly ready for transplanting as this year's crop.

In the face of the National emergency, other plants will be grown on a larger scale. Thus a project, originally planned as a source of varied plant material for a classroom and research study, is serving even a more useful purpose.

The original plan to devoting a single family of taxonomic group of plants to individual plots is being developed as rapidly as possible. Condiment plants, vegetable dye plants, and other groups, are arranged according to their relationships. All plants are carefully labeled with suitable warning against poisonous species.

INSTITUTIONS HOLDING MEMBERSHIP IN THE ASSOCIATION

NEW YORK

University of Buffalo, School of Pharmacy, Buffalo; A. B. Leman, Dean (1936).

Columbia University, College of Pharmacy of the City of New York, New York; Charles W. Ballard, Dean (1933).

Fordham University, College of Pharmacy, New York; Charles J. Dunn, Arthur Dean (1933).

Long Island University, Eastern College of Pharmacy, Brooklyn; Hugo M. Schaefer, Dean (1933).

NORTH CAROLINA

University of North Carolina, School of Pharmacy, Chapel Hill; J. Greer Beach, Dean (1917).

NORTH DAKOTA

North Dakota Agricultural College, School of Pharmacy, Fargo; William F. Seifer, Dean, (1932).

OHIO

Ohio Northern University, College of Pharmacy, Ada; Rudolph M. Neale, Dean (1935).

Ohio State University, College of Pharmacy, Columbus; Bernard V. Christensen, Dean (1930).

University of Toledo, College of Pharmacy, Toledo; Geo. L. Baker, Dean (1941).

Western Reserve University, School of Pharmacy, Cleveland; Edward D. May, Acting Dean (1932).

OKLAHOMA

University of Oklahoma, School of Pharmacy, Norman; David B. R. Johnson, Dean (1935).

OREGON

Oregon State College, School of Pharmacy, Corvallis; Adolph Hede, Dean (1933).

PENNSYLVANIA

Duquesne University, School of Pharmacy, Pittsburgh; Hugh O. Hadden, Dean (1937).

Philadelphia College of Pharmacy and Science, Philadelphia; Iver Geddis, Dean (1930).

Temple University, School of Pharmacy, Philadelphia; E. Hvert Keadle, Dean (1933).

University of Pittsburgh, Pittsburgh College of Pharmacy, Pittsburgh; Leonard O'Connell, Dean (1930).

PENNSYLVANIA

University of the Pittsburgh, College of Pharmacy, Meadville; Marlene V. de Spaulde, Dean (1917).

Puerto Rico

University of Puerto Rico, College of Pharmacy, Rio Piedras; Luis Torres-Gil, Dean (1933).

Rhode Island

Rhode Island College of Pharmacy and Allied Sciences, Providence; W. Henry Howard, Dean (1933).

SOUTH CAROLINA

Medical College of the State of South Carolina, Charleston; Robert Wilson, Jr., Dean; School of Pharmacy, Washington E. Leister, Director (1940).

University of South Carolina, School of Pharmacy, Columbia; Henry T. Motley, Dean (1933).

SOUTH DAKOTA

South Dakota State College, Division of Pharmacy, Brookings; Floyd E. Lobbins, Acting Dean (1934).

Tennessee

University of Tennessee, School of Pharmacy, Memphis; Robert L. Coover, Dean (1914).

TEXAS

University of Texas, College of Pharmacy, Austin; William F. Gilley, Dean (1934).

VIRGINIA

Medical College of Virginia, School of Pharmacy, Richmond; Worley P. Smith, Dean (1933).

WASHINGTON

University of Washington, College of Pharmacy, Seattle; Frank J. Goodrich, Dean (1935).

State College of Washington, School of Pharmacy, Pullman; Paul M. Blodgett, Dean (1913).

WEST VIRGINIA

West Virginia University, College of Pharmacy, Morgantown; J. Lester Hanson, Director (1933).

WISCONSIN

University of Wisconsin, School of Pharmacy, Madison; Arthur E. Uhl, Dean (1933).

